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Mail For McCahill..... 37
Tests The All-New Scout..... 76
Tests The Buick..... 80

REGULAR FEATURES

MMI: New Look In Kites..... 62
Inventions Wanted!..... 63
It's New!..... 67
Bright Idea: Extension Cord Timer..... 73
MIMI 83
Today In Space..... 84
Outdoors: Wet-Fly Fishing..... 88

SHORT FEATURES

The Facellia/Gold-Domed Seaquarium... 66
World's Largest Indoor Pool..... 70
They Torture Cars..... 72
Whirlybird Trainer/New Tank Killer.... 74
Dial-Everything House..... 85
Midget Ice Boat..... 86
Let Air Do The Work..... 92
Newest Model Planes..... 95

DEPARTMENTS

Dear Editor..... 18
Invention Clinic..... 24

HOME-CRAFTS-SHOP CONTENTS ON PAGE 10

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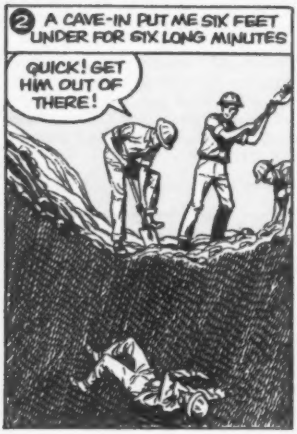

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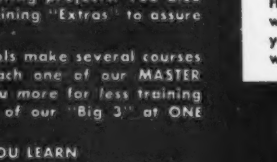

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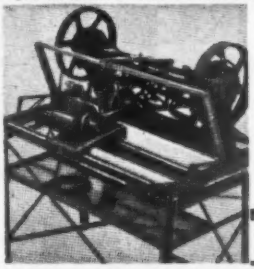

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continued from page 2

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Live It Up . . . Outdoors 98
Garden Trellis 106
Compost Box 108
Electrified Lawn Mower 110
Outdoor Drinking Fountain 112
Outdoor Coffee Table 152

HOME AND SHOP

Home Hints 140
Toys For Easter 142
Table-Top Aquarium 156

PAINTING

Fresh Paint Tips 121

BOATING

Build Pogo 122
Boating And Fishing Tips 127

ELECTRONICS

Glass—Handle With Care 134
Voice-Powered Telephone 150

AUTOMOTIVE

Your New Dodge Dart 146
Service Tips From Detroit 149

DEPARTMENTS

Golden Hammer Award Winners 128
MI's Hardware Store 130
Home And Shop Shorts 132

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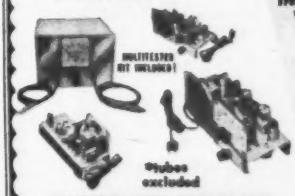

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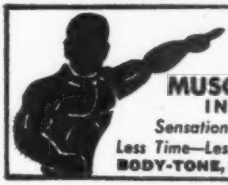

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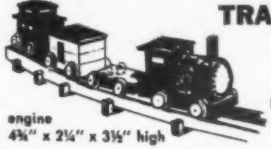

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PATENTS GRANTED

TESTS employing a newly patented solution containing sulfur, tartaric acid and iodine strongly indicate a cure has been found for Dutch elm disease. Glenn A. Brown of Huntington, Ind., was awarded Patent 2,967,-377 for his curative formula.

A battery-operated hearing aid so small it can fit completely inside the ear has won Patent 2,967,913 for Maurice Aubert and Eugene Miquelis, both of Nice, France.

You'll end up smoking air, then quitting smoking altogether, if you get with it—it being an unusual cigarette holder (Patent 2,967,528) invented by Joseph J. Kelter of Brooklyn, N. Y. The device controls the amount of smoke inhaled. By continually reducing the amount over a period of time, the user can ease himself into breaking the smoking habit.

Patent 2,966,965, awarded to Carlyle B. Stair of Glendale, Calif., covers a brake designed to immediately stop a house trailer should the trailer accidently become separated from the car while in motion.

Birds will steer clear of your garden if you sprinkle all the seeds that are sown with the bird repellent (Patent 2,967,128) developed by Morley R. Kare of Ithaca, N. Y.

Policemen may soon be using the all-purpose billy club invented by Samuel T. Voll, Great Falls, Mont. Assigned Patent 2,966,621, the club has a hook which can be attached to a prisoner and which can deliver a battery-powered electric shock.

Music lovers and record collectors may soon be able to buy an automatic record changer that varies the turntable speed according to the diameter of the record. John Cleybergh of Chicago, Ill., received Patent 2,966,358 for this invention.

John L. Barker of Norwalk, Conn., was awarded Patent 2,965,893 for his radar detecting device that automatically controls red light signals at intersections in response to the amount of traffic approaching the intersection.

Nocturnal fishermen can now enjoy their nighttime angling without leaving their campfires or cabins on a cold night. Frank Berghoff and Elmer H. Ricks, both of Lafayette, Ind., received Patent 2,964,869 for a signal device that lights up a bulb when a fish strikes, alerting the fisherman some distance away.

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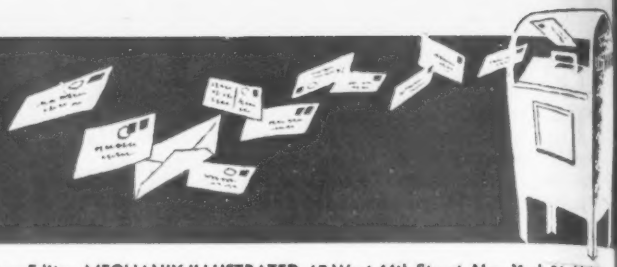
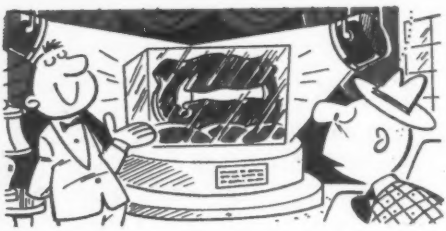


Address mail to: Letters Editor, MECHANIX ILLUSTRATED, 67 West 44th Street, New York 36, N.Y.

● *Happy Hammer Winner*



Just received my Golden Hammer Award. It is indeed a beauty and you can rest assured it will be placed in a prominent spot in my home. Please accept my sincere thanks.

H. C. Behnke
Columbus, Ohio

● *Acid-to-Water*

Referring to a letter in your Dear Editor column of January 1961, I should like to clarify your reply to Morris L. Suiter regarding the cleaning of brick with acid. You advise him to make a brick-cleaning solution by adding water to muriatic acid. Gentlemen, this is dangerous advice and, if followed, could cause serious injury. Water should never be added to acid! Always add the acid to the water! Also, the acid should be added very slowly and stirred with a glass rod.

Willis C. Barnhouse
Registered Pharmacist
Seattle, Wash.

● *Cricket, Anyone?*

You have an article in a recent issue titled New Look In Crickets (January MI). Could you please provide me with the address of Mr. Ray Selph's cricket ranch? Just gotta get me some of those crickets to help catch me some of these beautiful Florida bass.

Paul Reed
N. Miami, Fla.

Sure, Paul. It's P.O. Box 2123, DeSota Station, Memphis 2, Tenn.

● *Hobbies Into $$$*

Here's an invitation to other hobbyists around my age (22) to contact me for the purpose of exchanging ideas about hobbies that can be made into profitable enterprises. Regarding this, your readers might be interested in a hobby that I have developed into a thriving little business. This is the painting of initials and monograms on 24-gauge steel that is cut to the same dimensions as automobile plates. Today 13 states issue only one license plate, yet most of the new cars are built with an indentation for a license plate on their front bumpers. The personalized plates that I make are installed in this front-bumper recess and give a car that "full-dressed" look. I sold 623 of these decorative plates during the first six weeks I was in business.

Freddie R. Samples
P.O. Box 263
Corbin, Ky.

● *Doubting Thomas*

Now look fellas, I don't mean to question the veracity of MI or your rotund car-tester, Tom McCahill, **but**—do you mean to tell me (1) that Uncle Tom drove that Tempest (McCahill Tests The Pontiac Tempest, February MI) from Chicago to New York in a race against the 20th Century Limited, and won! And (2) that he didn't break any speed laws along the way?

Sanford W. Crabbe
Minneapolis, Minn.

(1) He sure did; and (2) he ain't talkin'.

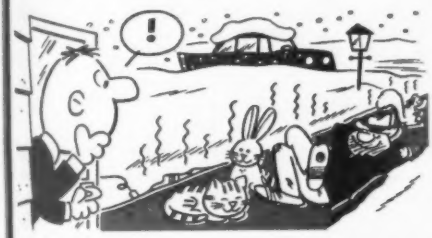
• *Drilling Through Glass*

I have been thinking of making some lamp bases out of bottles but have been stumped by the problem of drilling holes through glass. If you know how this can be done, please tell this bewildered reader the secret.

John Marinovich, Jr.
Boonton, N. J.

Try this, John: Use some wax to mark the spot on the bottle where you want to drill the hole. Then take some putty and build a small dam around the mark. Next, pour a pasty mixture of water and carborundum dust in the hollow formed by the putty. Place the bottle on your drill-press table, line it up under a high-speed metal drill, then very gradually bring the drill down onto the mark. Be especially careful when finishing the cut to avoid splintering the inner side of the hole.

• *Warm Welcome?*



One of your Inventions Wanted contributors, Royal Basky (February MI), may or may not be on the right track with his idea of an electrically heated tarpaulin that could be laid over a snow-covered driveway to melt the snow. Wouldn't this king-size heating pad attract a lot of unwanted guests like woodland animals, stray cats and others?

Charles Brasser
Montreal, Canada

Not necessarily in that order.

• *Chemistry Course*

I am a fan of your magazine. I have been reading it for over six years and want to congratulate you for an outstanding magazine. But I have one question for you: Why don't you have a page on chemistry?

Raleigh Marcell
New Iberia, La.

You mean you haven't noticed MIMI? •

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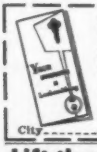

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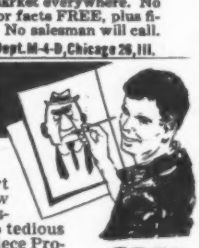
LIKE TO *Draw?*



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SCIENCE SHORTIES

ONE of the glands that controls social existence and produces harmony in bee colonies has been successfully removed from bees for the first time. There's progress!

Infrared aerial photographs of forest land can be used to identify different species of trees in the forest.

"Tin cans" are really made of steel coated with a thin layer of tin.

Women live longer than men in the U. S. and the relative difference has increased since 1900.

The U. S. Navy may soon store fuel in underwater tanks fixed to the ocean bottom.

The world population will be 3,000,000,000 by the end of 1961.

What's a snail's pace? The average snail tears along at 6.5 inches per minute or .00248 mph, according to scientific timings of traveling snails.

Bluebirds know their alarm, hunger and location calls instinctively but they learn their mating calls from their parents.

In the U. S. there are about 925 radio receivers per 1,000 of the population.

Speedometers vary in accuracy according to tire wear, temperature, load and other traveling conditions.

The ant has two stomachs: one for himself and one for a storehouse in which he stores food for himself and other ants.

A century ago tomatoes were grown only as an ornamental curiosity—they were not considered edible. Today Americans eat 4,500,000 tons of the succulent "love apples" in a single year.

Small animals can be hypnotized by human beings.

Tallow, the old candle material extracted from beef or mutton fat, is used as a base in lubricants for jet aircraft engines.

A recently-developed traffic safety device uses an electronic beam to warn motorists when they are too close to the curb or to the centerline.

Who buys the most petroleum products in the U. S.? The military; they buy almost 700,000 barrels a day.

There are about 26 trillion cells in a human body.

Space experts say that rubber and plastics may prove to be stronger in outer space than they are in the atmosphere of the earth.

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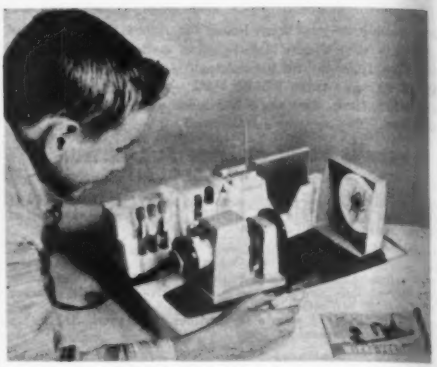

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Invention Clinic

Joseph H. Kraus

In this column each month Mr. Kraus will answer as many letters as space permits on those subjects he feels to be of widest general interest. Time does not allow him to reply to any letters except those printed here. Address your questions to the Invention Clinic, *Mechanix Illustrated*, 67 West 44 St., New York 36, N. Y.

Car Float

A. Mertens of Antwerp, Belgium, has patented a device to keep a car afloat. He thinks this invention might also have a military application because it would enable an army to cross a river by automobile. What do I think of it?

Assuming the average car weighs 3,500 pounds, without passengers, you would need floats capable of displacing 54 cubic feet merely to keep the car awash. You would also need equipment to expand the floats almost instantly. Finally, you would need a place where the collapsed floats could be carried. I doubt very much if any accessory manufacturer would be interested in marketing such a device for the consumer market. The cost would be prohibitive. You *might* get a favorable audience from the military if you build an accurate model of your unit that can be demonstrated.

Ingrown Nail Relief

David O. Mason of Chamberlain, S. D., has designed a device to lift ingrown toenails. Should he apply for a patent? Is it worth the expense?

This could become a valuable invention if no other foot troubles follow its use. Perhaps a chiropodist would be willing to test the device and give you an evaluation as to its effectiveness. A patent search is also suggested. If this is favorable you will have to bear the expense of a patent to protect your invention.

Automotive Design

Kinsley E. Worman of Silver Spring, Md., has been unable to locate in the Patent Office any automotive design which compares with a design he has originated. Neither can he locate a draftsman who can diagrammatically unite the different units that comprise his design. Where does he go from here?

Discuss with a patent attorney the possibility of protecting the design, then apply for a separate patent to cover the mechanical connections. If, as you imply, you can produce a model, your attorney and his draftsmen should have little difficulty depicting it in drawings.

Payment At Discretion

Thomas N. Wakefield says he recently contacted a company about an invention he had perfected and was asked to sign a paper giving away all rights to his idea. Payment would have been at the discretion of the company. Don't companies want good products? Or are they naive enough to believe that a person will sign over his work on such a contract? Where is there a company which will take over an idea, promote it and give the inventor a share of the future profits?

INVENTOR'S TIP OF THE MONTH

There should be quick public acceptance for a small, hand-held electric cultivator comparable in size and weight to electric hedge clippers. It ought to sell at a lower price than hedge clippers because it would require fewer parts.

You have furnished no proof that you actually are the originator of this idea. Remember, you have no right to sell an "invention" until you establish ownership through a patent. A patent does not represent a large capital investment. Companies do indeed want good products but you must locate one that is willing to invest in your invention. However, no outfit today will gamble its money and time on a non-patented invention.

Destination Indicator

Erwin Martell of San Francisco, Calif., describes a device to guide the operator of a land, sea, or air vehicle unerringly to his destination. Does this have commercial possibilities if it can be marketed in a $12 to $15 range?

Indeed it does. However, you have no coupling between the speed and real direction of the vehicle. While a speed coupling is feasible on a land vehicle, it is impossible on the water or in the air with any apparatus as inexpensive as you estimate. If you can overcome this obstacle you will have a very valuable product.

Bowling Aid

Wendell L. Oder of Richland, Wash., has a patent pending on a bowling aid in three different forms, two mechanical and one electrical. He imagines the items would be sold for $2.50 to $4.50. Should he try to secure a buyer while the patent is pending?

Consult your patent attorney to find out if he thinks you are safe in discussing sale of the idea at this time. Then make the rounds of some bowling alleys to learn if there are any regulations that would prevent the use of your invention. I should think your most logical market would be companies which make equipment for bowling alleys.

Cartridge Pipe Tobacco

Albert Griffin of Sacramento, Calif., remembers that it used to be possible to purchase pipe tobacco in cartridge form and wants to know how a patent can be granted for something like this.

Yes, around 1909 many companies in the U. S. marketed tobacco rolls that could be dropped directly into a pipe bowl. Without investigating the claims for the patent to which you refer, it would be impossible for me to suggest on what basis the patent may have been granted. But you might look into this for yourself. A copy of such a patent costs 25 cents in coin. Order it directly from the U. S. Patent Office, Washington 25, D. C.

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Because of their unique design and the near-diamond hardness of the material, AC Fire-Ring Spark Plugs are highly resistant to fracture and resulting shorting and missing.

AC Fire-Ring insulators are made of aluminum oxide, the material of rubies and sapphires. AC pioneered the use of alumina powder for spark plug insulators and developed a special processing formula that makes it extra hard and extra strong. AC engineers devised an insulator design which utilizes this strength to provide important benefits in heat control and over-all insulating properties.

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AC SPARK PLUG THE ELECTRONICS DIVISION OF GENERAL MOTORS

AC Fire-Ring spark plugs

They must be the best!

MAIL FOR McCAHILL

UNCLE TOM ANSWERS HIS MOST INTERESTING LETTERS IN THIS COLUMN. WRITE TO HIM AT *MECHANIX ILLUSTRATED*, 67 WEST 44TH ST., NEW YORK 36, N. Y.

● *In your opinion, what performance could be expected from a Powerglide-equipped Corvair towing a boat and trailer with a combined weight of between 1,200 and 1,500 pounds? In particular, I am interested in braking ability, general safety of operation at highway speeds and ability to climb a steep grade.*

L. G. Freer
Omaha, Neb.

The Corvair is one of the last jobs I'd pick to do this job as the car definitely wasn't designed to haul around ¾ths of a ton additional weight. This goes for the brakes and hill-climbing qualities, too. I don't doubt you *could* do it—the same as it's possible to kill a rhino with a .22. But it's not recommended.

● *Just a note to let you know I think you are not only a bald-headed baboon but stuped, too. What have you got to say to that?*

Harry Kline
Chicago, Ill.

You misspelled stupid.

Diogenes Department

Recently, while making some test runs on the west coast, I popped the metal pipe leading into the expansion tank of the radiator. With the aid of some water loaned to me by a Pacific Power & Light truck, I reached Lundy's Garage in Banning, Calif. Mr. Lundy had to remove the entire radiator core and resolder the pipe fitting and reinstall it. He did the job in a hair under one hour because I told him I was in a hurry. The total bill (and believe me, he didn't know me from Joe Blough) was three bucks! Mr. Lundy, I salute you. You not only know your trade but you haven't learned to overcharge. What the automobile business needs is a few more Lundys.

● *What's the dope on the expensive aluminum wheels now being offered as accessories on some cars? Are they worth the extra price?*

G. J. Sears
San Diego, Calif.

I'm running a test on some now but haven't had them long enough yet to form a positive opinion.

● *Last week a thermostat went bad in my 1959 car which has what you call an "idiot light" temperature gauge. Anyhow, the first time I knew anything was wrong was when I saw steam coming up through the cracks of the hood. I pulled over to the side of the road and turned off the switch. The engine was so hot that it kept on running even with the key off. One of the hoses had split. I'm just lucky I didn't ruin the whole engine as there wasn't a pint of water left in it. What I want to know is why the damn light didn't turn red? It didn't—because that was the first thing I looked at. The bulb isn't burned out because it still turns red when I turn on the switch before the engine starts. I'm disgusted with modern "progress."*

George L. Levy, Jr.
St. Louis, Mo.

I'm disgusted too, George. We all know idiot lights are for idiots but when even the idiots refuse to act like idiots, it's time to look up a good horse. Incidentally, most of these lights aren't supposed to go on until you're many degrees above the boiling point, when your chances of doing some real harm before discovery are multiplied many times. *This* is space age engineering?

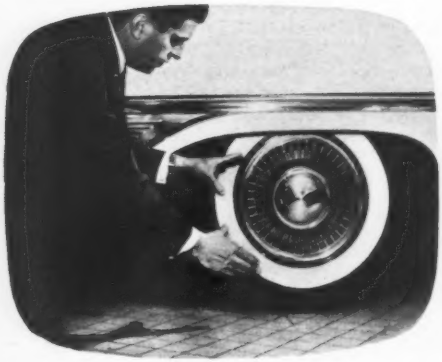
● *My husband is a very impatient man to tour with. I like to read all those historical markers alongside the road but he won't stop and waste the time. Here's how*

[*Continued on page 40*]

TV's Professor Jonathan Karas shows why

The brakes

Professor Jonathan Karas, physicist at Lowell Technological Institute, uses a rifle to demonstrate—as he does on Ford's TV shows—a remarkable feature of the '61 Ford.



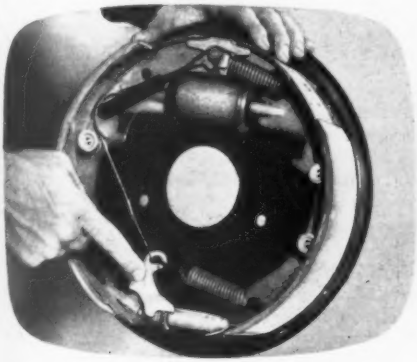
3. "This principle of harnessing existing energy is employed in the brake system on the '61 Ford. When linings wear down, they no longer have to be adjusted by hand!

4. "In stopping a car, the brake shoes are not only forced against the drum, but the whole assembly tends to shift slightly in the direction the wheel is rolling.

on the 1961 Ford adjust themselves automatically

1. "Here are two types of rifles. One is a bolt-action, the other an automatic. The automatic does one particular job that has to be done manually with the other rifle.

2. "It uses its own energy to eject one shell and introduce another. This is a perfect example of harnessing energy that would otherwise go to waste.



5. "Ford uses this motion (and energy) to adjust the brakes while in reverse. It turns the adjusting nut when necessary, doing the job *automatically and more precisely* than by hand.

6. "Self-adjusting brakes . . . 30,000 miles between chassis lubrications . . . 4,000 miles between oil changes! All are features of the '61 Ford, *beautifully built to take care of itself!*"

FORD DIVISION, *Ford Motor Company,*

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Sing the song of the sixties with Dyna-Glas whispering power. Rocket-age fiber glass packing — and exclusive "Whisper Chamber" — release built-in factory power — but lullaby low.

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MUFFLERS AND PIPES
Dept. A-16, 619 Smith St., Toledo 1, Ohio

Mail For McCahill

[Continued from page 37]

I solved it—and some others may be interested. I got a Polaroid camera for my birthday and when I see a marker I want to read, my husband slows down close to the sign, I snap a picture of it and off he goes again. A minute later I'm reading the entire sign at my leisure. How is that for an idea?

Mrs. Herbert Spaulding
Richmond, Va.

Well, it is a new approach but until Col. Land gets ready to give Polaroid film away, it sounds a little expensive on a very long trip. Of course, you can keep the pictures for a scrapbook.

● *Why don't you suggest electrically-powered, fully-retractable fins to your friends in Detroit?*

Stanley W. A. Turnbull
Haddonfield, N. J.

Friends?

● *I was told that you recently made the statement that no car made in America comes equipped with really good shock absorbers. Did you say this?*

Arthur F. Graber
Miami, Fla.

In the words of Gary Cooper, Yup.

● *I recently installed mechanical oil pressure and water temperature gauges in my car. They work fine but make a lot of noise. To me it sounds like they are transmitting valve noise. How do I stop this?*

Ronald Smith
Lancaster, Calif.

Turn the engine off. Seriously, if these instruments are telegraphing noise into the cab, maybe you should have tapped in at a quieter spot on the cooling and oil system. Mechanical gauges are always noisier than electric ones and, nine times out of ten, more accurate.

● *Your statement on page 91, Nov. 1960 MI, accusing gas stations of diluting premium gas with regular gas for the extra profit was hardly called for, as there are cheats in every business, including yours. We gas station operators never touch our gas except when we spill it on your fenders like the slobs we seem to be, and we most certainly have no facilities to pump from one tank to another. Oil companies and jobbers do, though, and they're the people who control the quality of the gasoline, not us. I'll think of you every time a customer of mine comes in looking at me like I*

[Continued on page 42]

Pardon me sir, can you tell me
where I can buy a pair of General Electric Suburban Headlamps?

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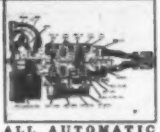

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Mail For McCahill

[*Continued from page* 40]

was cheating him. Thanks a lot, and DROP DEAD!!!

R. F. Smith
Chillicothe, Ill.

If you'll allow me to postpone your suggestion for a moment about dropping dead, perhaps *you're* the honest one. We've only had three letters from irate service station operators in addition to yours. Someone is cheating and we don't care much who, providing the practice is stopped. Incidentally, if you don't know how to cut high test with regular in a filling station, send for our free book (which we'll publish some year), How To Cheat For Fun & Profit.

● *Please help settle an argument. My buddy says he knows a guy who had a '57 Ford with a stock Thunderbird motor and a four-barrel carburetor that could do 110 mph in low gear. As for my buddy, I hate to call him a liar but that's what it looks like.*

Bob & Ron
Hammond, Ind.

Sure does.

● *A friend of mine says he just drove from New York to Miami and averaged 66 mph all the way and got just under 20 mpg. I'm not doubting his gas economy so much but I find it pretty hard to believe that anyone could average 66 mph today from New York to Miami. What do you think?*

Ted Hertz
New York, N. Y.

I agree with you. Anyone who tried to average 66 mph from New York to Miami would be arrested at least a dozen times on the way. Such an average would require running between 80 and 100 mph much of the time. It's been a mystery to me for years but it's true that nine out of ten motorists lie through their teeth about their speed and gas consumption averages. I've had bank presidents, corporation presidents, college professors and even an occasional member of the clergy tell me or write me about motoring feats they claim to have accomplished which, if you're in the business I'm in, you know are absolutely ludicrous.

Within the past ten days, two middle-aged men I respect in every other way and would entrust with the care of my last dime, lied to me about speeds they'd just made. One of them—a notorious chicken who screams at any speed above 60 mph—walked into my house a few days ago and told me he'd just made a trip of over 1,000 miles at an average

[*Continued on page* 44]

NEW ALUMINUM V-8 AND ALUMINUM TRANSMISSION GIVE YOU BUICK GO WITH SMALLER CAR GAS SAVINGS

You don't have to be a car afficionado to see why the new-size Buick Special is such a hit. The facts speak for themselves . . .

The Special has a new kind of engine — the sizzling Fireball V-8. Made of *aluminum*, it packs a 155-h.p. wallop . . . but weighs up to 200 pounds less than engines with only two-thirds its power! With the highest weight-to-power ratio in the industry — .487 horsepower per pound—this Fireball V-8 gives you more go than many a full-size car. And with 8.8:1 compression, you use just regular gas and get gas savings that challenge the compacts.

Just as exciting is the Special's new *aluminum* transmission* — liveliest automatic on any car. It works on a "dual path" principle. When cruising, about 70% of the driving forces go through a turbine torque converter, and 30% through a planetary gear set. This way you enjoy the go and gas savings of gear transmission with the smoothness of turbine drive.

Add to these Special virtues, Buick comfort, ride and pride — and you've got yourself quite a car — quite a buy, too. Drive it at your Buick Dealer's. Buick Motor Division — General Motors Corp.

**Aluminum Dual-Path Turbine Drive—optional at extra cost.*

BUICK SPECIAL

THE BEST OF BOTH WORLDS

[Continued from page 42]

speed of 69 mph. Another claimed to have driven non-stop from Fargo, N. D. to New York and averaged 64 mph all the way, despite having had a flat! But these are harmless boasts, just like the kid who comes in and tells you, "I just shot an elephant in the back yard."

● *A friend of mine contends that there is a motorcar hell for drivers like me who labor my car and misuse it in other ways.*

Jan Paul Baduard
Pretoria, South Africa

Don't worry about it, Jan. The motor manufacturers have already sent down a supply of choice champagne, tons of steaks and, of course, girls to keep you guys who are using up their products happy.

● *Recently I purchased a Volkswagen, a so-called "economy" car. In the November 1960 issue of MI (page 50) you suggested that this vehicle is capable of delivering 35 mpg. The VW ads indicate "an honest 32 mpg." The Shop Manual indicates that it should be capable of 30 mpg under ordinary driving circumstances. My own vehicle delivers from 23 to 26 miles per gallon.*

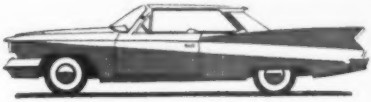
J. William Fielding, M.D.
New York, N. Y.

Jim McMichael, who has been running a test on Volkswagens since 1954, claims his latest one with a little over 60,000 miles on the clock shows, in his carefully-kept log book, to have averaged 35.6 mpg for the total mileage. Nearly all this was country or long-trip driving and not over 500 miles of city use. I notice you live in New York City.

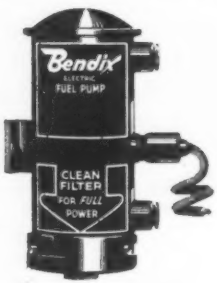
● *I've just read with a great deal of interest your reply to a letter regarding undercoating of cars. Being the owner of a body shop, this has always been a pet peeve of mine, not only from the standpoint of making body work more difficult, more expensive and time-consuming, but from the standpoint of eventually defeating one of its prime purposes by causing rather than preventing rust. It's true that there are many advantages to correctly-applied undercoating but it is seldom applied correctly. Drain holes are pro-*

[Continued on page 46]

IF YOU'RE A PERFECTIONIST ABOUT YOUR



THEN YOU SHOULD HAVE A



Here's the all-weather answer to starting problems. Performance-proved at 150°F. *above* and 65°F. *below* zero, the Bendix® Electric Fuel Pump gives instant hot-weather restarts, instant cold-weather starts. It prevents vapor lock, provides longest operating life. To start better—to go better—make it *Bendix*. See your dealer.

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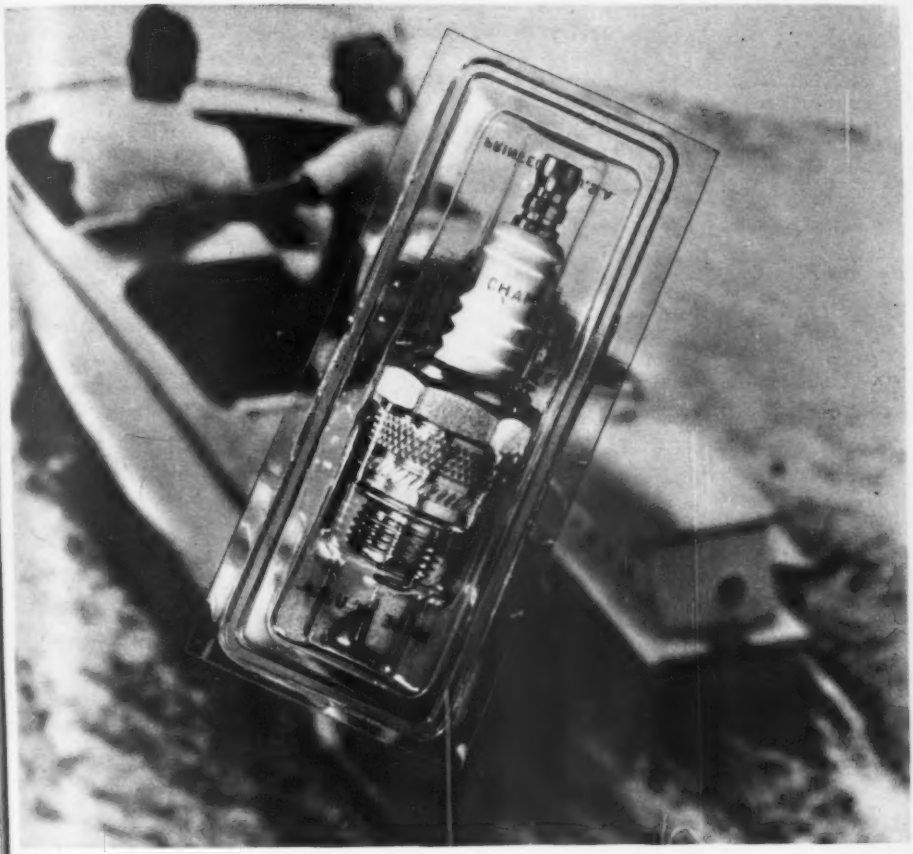
ELMIRA, N.Y.

THE Bendix CORPORATION



Start the season with *this* spark plug—especially designed for boating by Champion!

Loaded with outstanding and exclusive features, this great marine Champion is performance-proved! It gets the best out of every outboard—including yours . . .

This great marine spark plug is especially designed for boating by Champion—the spark plug specialist! It's the kind of spark plug you need for top performance in *your* marine engine. (These marine Champions sparked every class winner in both the 1960 National Stock Outboard meet and the APBA Outboard Championships!)

In waterproof packs that make them ideal as spares, too, these Champions have rust-resistant plating, attached gaskets for easier installation, and Powerfire marine electrodes for longer plug life. Get the new boating season off to a sparking good start with a new set of the spark plugs especially designed for boating —*marine Champions!*

DEPENDABLE

CHAMPION

MARINE SPARK PLUGS

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[Continued from page 44]

vided in the bottoms of doors, rocker panels, quarter-panels and cowls to remove water. When these holes are plugged with undercoating, rust soon takes its toll. Panel replacements because of rust were uncommon until undercoating became popular. Yes, Tom, my next car will be undercoated, but I will personally see to it that these drain holes are fully protected before the slosh flows through the gun. If we still disagree on this one point I will remain an avid reader.

John W. White
West Brookfield, Mass.

We don't disagree, John. I never advocated a lousy undercoating job. Here's for more quality workmanship.

"Who's On First?" Department

I have had a great many letters regarding a mention I made of a Valiant high-performance kit, which is also available for the new Lancer. Many readers wrote in, saying their local Valiant dealers had never heard of such kits.

The Chrysler Corp. has definitely filed specifications with the Automobile Manufacturers Association not only for the 1960 but the 1961 version as well of an extra-performance kit which includes a four-barrel carburetor, a different manifold and a different cam. Now, if any stupid dealer gives you any guff about this, there are two things you can do: Write to Jack Charipar, Chief Engineer of Plymouth, in Detroit; or, for hotter immediate action, write to Norris Friel, Chief Inspector, National Association For Stock Car Auto Racing, Daytona Beach, Fla. Friel was amazed when I handed over to him some of the readers' letters on this subject. He says that if there is any question as to the availability of these kits, all Valiants and Lancers so equipped will be banned from racing (and I doubt if this would sit very happily with the Chrysler Corp.).

● *I'm thinking of buying a 1953 MG-TD and fixing it up myself. I plan to motor up and down and throughout the entire Sierra Nevada mountains during week-ends and vacations. My inquiry is this: is this car powerful enough and able to take these mountain roads and curves without any trouble?*

Mas Kojima
Berkeley, Calif.

Providing you get the MG in top shape, meaning engine and suspension, it will prove a great car for touring the High Sierras and would have plenty of power; of course, you'd have to use the gearbox now and then. I've toured all through the High Sierras with MGs.

● *I have heard tell that motorcycling wrecks the kidneys.*

Dave Adamson
Ottawa, Canada

Whiskey's bad for them, too.

● *I have been long interested in converting my present automobile to steam. I'd appreciate any assistance you can be to me in this matter.*

Dan W. Lindenau
2171 McKinley
Berkeley, Calif.

The quickest and simplest conversion method is a bonfire under the radiator core—you'll have steam before you know it. Seriously, there used to be a guy down in Long Beach, Calif., who successfully converted V8 Ford engines into steam-driven engines. I drove one of them some years ago; in fact, pulled a truck with it. I don't remember his name but a few inquiries in the Long Beach section (not too far from you) should produce results.

● *I've had many a chuckle over your pithy comments regarding the modern automobile in MI. Personally, I don't like any of them. What am I going to do? I am going to steam. I can convert a compact to steam for approximately $1,500. Just think! ! !*

John W. Howe
St. John's Hospital
Red Wing, Minn.

John, meet Dan (above).

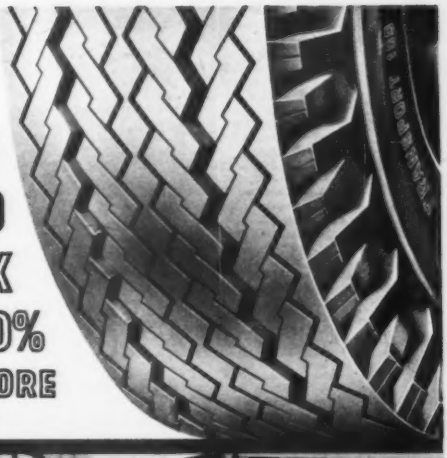
● *I remember when I was very young my family had a Nash Ambassador (1935) which had a twin ignition. This meant, in case this was before your time, that there were two spark plugs in each cylinder. We got amazing gas mileage and the plugs didn't foul up as they do today. Do you think such a system would be feasible today?*

Frank R. Dougherty
Ardmore, Pa.

Thanks, Dad, for the youth insinuation but I recall dual ignition very well. In addition to Nash, Marmon and many other cars had two spark plugs per cylinder. The Silver Ghost Rolls-Royce featured not only two spark plugs but two separate ignition systems: one battery and the other magneto.

[Continued on page 48]

NEW Firestone TRANSPORT-100 BOOSTS TRUCK TIRE MILEAGE 50% ...AND MORE



NOW... on your trucks... get an extra tire mile for every two you run!

109 million test miles prove the Firestone all-wheel position Transport-100* delivers 50% and more original tread mileage and more all-weather traction than any other regular original equipment Firestone tire. Even when half-worn it gives *faster starts* and *quicker stops* than most truck tires when new. Why? ■ A new tread design. ■ Torque-toughened Firestone Rubber-X; Shock-Fortified cord. ■ A flatter crown to equalize tread print pressure. ■ A broad center rib for better load distribution. ■ "Stone guards" to keep tread pebble-free. See the new Firestone Transport-100 at your nearby Firestone Dealer or Store! In Nylon or Tyrex® rayon cord, tubeless or tubed.

*Firestone T. M.

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Mail For McCahill

[*Continued from page* 46]

The overhead valve V8 engine made the use of two plugs per cylinder impossible to service and besides, modern ignition gets along very well on one good plug. Aircraft go in heavily for the dual-plug system because of the safety factor, as it is possible for one plug or the wiring to go bad and yet still be hitting on all cylinders. It also makes testing the engine simpler by being able to cut out one bank at a time and seeing if the rpm remain the same.

● *About a month ago I purchased a used '55 Studebaker V8. Where can I get a copy of the Shop Manual for this car? I've written to Studebaker but their supply is exhausted. I've tried the local dealers but no extra copies are available. You might suggest to your readers that they get Shop Manuals for their later-model cars while they are still available.*

A. J. Theil
4345 W. 145th St.
Cleveland, Ohio

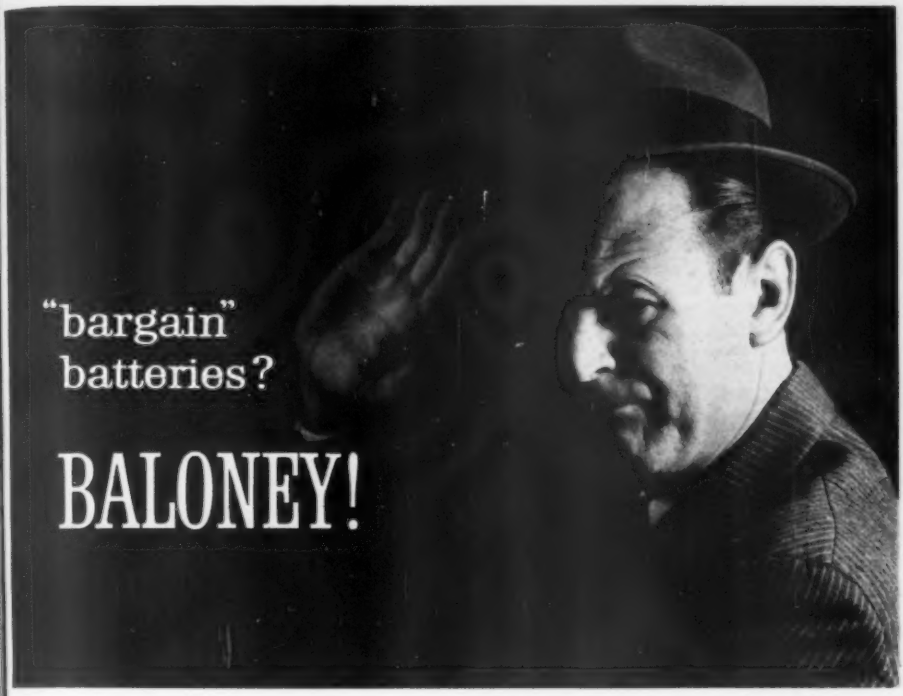
This is an excellent suggestion for any reader who contemplates keeping his current car for some time to come—get those Manuals now. If any of you boys or girls have a Shop Manual for a '55 Studebaker V8, contact Mr. Theil direct.

● *My husband is an old fan of yours but to my way of thinking he has an almost unforgivable fault: His one and only hobby is hunting and when he brought home an innocent-looking deer he'd shot last fall I felt he wasn't much better than a common murderer. I feel you won't agree but would like to know your thoughts on this.*

Alice F.
Westport, Conn.

Alice, I've been hunting regularly since I was ten years old, when I used to go to the Susquehanna Flats to shoot Canvasback ducks. For some time now I've realized there are two distinct types of men who go in for hunting—sportsmen and killers. In my book, the killers *are* no better than murderers. They seem to get their enjoyment purely from the act of killing for killing's sake. I've been on hunting parties where men who were seemingly perfectly normal suddenly got a glazed look in their eyes and would shoot *anything* from doe deer to stray dogs—and even the other hunters if it didn't mean the chair. These guys aren't sportsmen; they're jerks. The sportsman never kills beyond a reasonable limit for the table (even when he's poaching

[*Continued on page* 50]



That "cheapie" battery price tag may look great now . . . but it could mean trouble! For a little more, a sure-starting Delco DC-12 can save you lost wages, inconvenience, embarrassment.

DELCO IS DRY CHARGE . . . 100% FRESH!

You get all the power you pay for with a Delco DC-12. No power loss on the shelf . . . it's dry 'til you buy. The dealer adds activator fluid and then it's 100% fresh, ready for work . . . with extra reserve power for the high compression engines and electrical accessories on today's cars.

DELCO GIVES YOU QUALITY FEATURES

Here's your best battery buy! **Hard rubber case** is durable, resists heat distortion. **Extra fluid capacity** for fewer refills, less danger of low fluid level. Balanced-gravity, all-season fluid for top battery power at any temperature. These and other features make Delco the **true bargain!**

DEALERS CONVENIENTLY NEAR YOU

Your local Delco dealer appreciates your service business. He knows your driving needs, will specify the right Delco for them. And automotive service is his **specialty**, not his sideline!

FOR SURE STARTS . . . DELCO DC-12!

For dependable, year round starting, you can't do better than a 100% fresh Delco Dry Charge. Delco is original equipment on more new cars than any other battery, first choice for replacement, too. Get a battery check from your Delco dealer soon. If replacement is indicated, make it a Delco DC-12!

DELCO . . . "A GOOD NAME FOR GOOD SERVICE!" / *Another reliable General Motors product, distributed nationally through* UMS

1960 MODELS IN ORIGINAL CARTONS
Brand new! Not seconds! Not damaged!

8" TILT ARBOR POWER SAW

comp. as shown less blade

SOLD DIRECT FACTORY-TO-YOU

Heavy duty, all cast iron and steel construction. Shpg. wt. 25 lbs. Precision ground cast table. Massive cast mitre gauge. Patented motor drive fits any motor. Blade tilts, table stays level. Finger tip adjustable depth cut 0" to 2¼". Cross cuts, bevels, rips, cuts compound angles. These are brand new units from unsold stock offered at bargain price. Carries unconditional guarantee. If not completely delighted with your bargain — FOR ANY REASON — return for money back refund. All tools sent express collect. Send check or M.O. $2 deposit on C.O.D.'s. We reserve right to refund money if stock is exhausted. Avoid disappointment. Order right now!

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Please rush Model 161. I will pay on terms specified. Otherwise I will return tester.
Name_____
Address_____
City_____ Zone____ State____
All prices net, F.O.B., N.Y.C.

Mail For McCahill

[*Continued from page 48*]

and, believe me, true sportsmen can poach and shoot out of season when man-made laws are unreasonable).

The sportsman is not a killer in the same sense as the man who kills dozens of unretrievable birds, more deer than he can reasonably use or any other form of game. I've known of hunters who've killed game and ignored it just so they could go on killing more, and then leave the scene of the crime with just their legal bag limit. I've known many "killers" and I've never liked one of them or gone shooting with him twice. Hunting can be one of the finest sports in the world for the true sportsman and gentleman with a moral bag limit but the swine in the hunters' ranks have ruined the sport in many sections of the country.

● *I like to keep my car neat as the day it was delivered. The other day I was about to wash the engine with soap and water and a brush when a friend dropped by and said I'd ruin it. We decided to write you and let you settle it. How about it—who's right?*

Jack Justice
Cleveland, Ohio

Thousands of engines have been washed with soap and water and a brush without the slightest harm. It is a good idea, however, to have the engine fairly warm before you start the cleaning as the engine heat will dry up the moisture you get around the ignition system and plugs quickly, for easy re-starting after the bath. A clean engine has one big advantage—it makes it easier to spot trouble in the form of oil or gasket leaks that wouldn't be noticed on a filthy pot. When I was in the garage business we would never put a wrench on an engine that wasn't immaculate. If an engine came in dirty, we washed it and put it on the bill.

● *We were having tea at Balmoral when the discussion turned to the Whiteman Omelette. We all agreed when the Queen stated that it was perhaps overrated by Windsor.*

George Washington Jones
Co-Existence Bagel Shop
San Francisco, Calif.

Feuds, feuds, feuds.

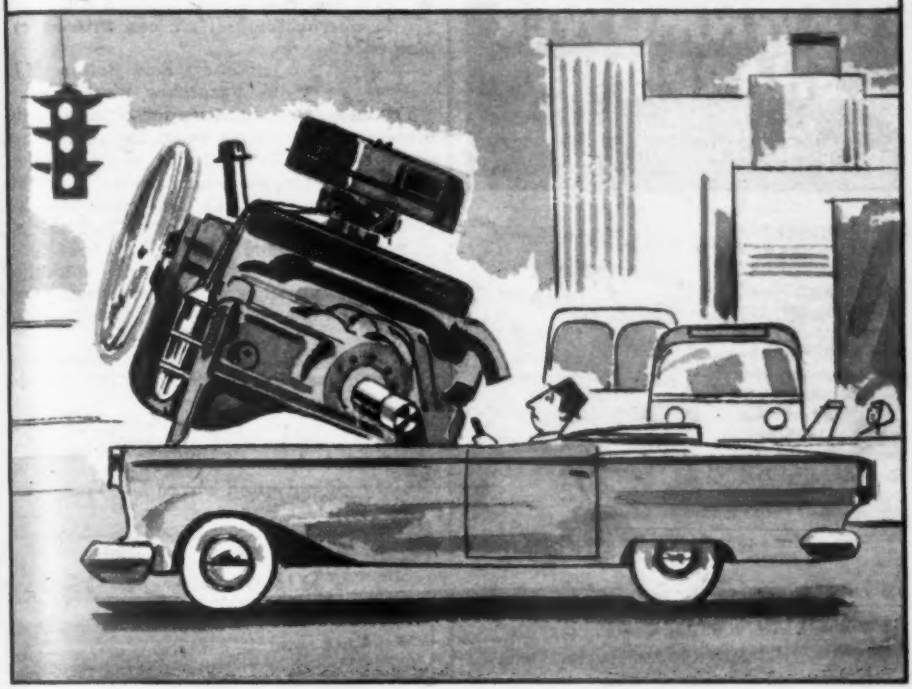
● *Could you explain in simple language just how a distributor really works?*

Karl Gerber
Chicago, Ill.

Yes.

[*Continued on page 52*]

What to do about excessive driving costs . . .



50% of your driving time

Your engine is too big for your car

"Easy" driving is hard on cars—actually costs you more! In traffic, for instance, you're using only about 1/10 of your horsepower. That means incomplete combustion and gasoline waste — sludge build-up — excessive engine wear. Result: total driving costs skyrocket!

Using Pennzoil with Z-7 gives your engine the extra protection it needs in "hard", low-speed, city driving—as well as on the highway. And its exclusive power ingredient, Z-7, stays active and keeps vital parts *clean*, straight through to the next oil change.

You can keep driving costs down, step up gas mileage, get new smooth power. Just ask for Pennzoil Z-7 by name at your favorite service station, garage or car dealer. Always be sure to sound the "Z" that makes PENNsylvania OIL— PENNZOIL.

PENNZOIL Z-7 — WORLD'S RICHEST, MOST COMPLETE MOTOR OIL

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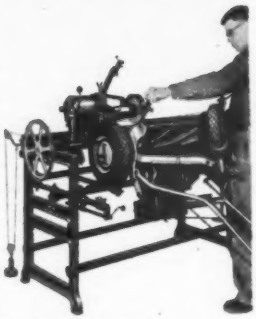
NEW IDEAL 900

LAWNMOWER SHARPENER

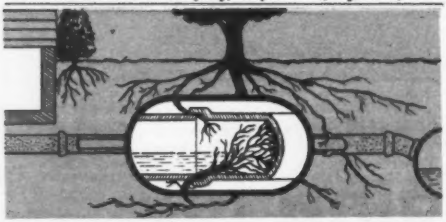
with "Two-Way" Grinding Option means big volume and big profit for you!

Unit sharpens any reel-type mower either by "hook" or "straight-line" method—for top versatility. Gravity feed. Screw-type adjustments. ½ h.p. motor. 6-inch grinding wheel. Includes: Bed-knife grinder, reconditioner and Tool Tray.



Write today for full details!

The Fate-Root-Heath Company, Dept. MI-4, Pymouth, Ohio



END SEWER-LINE ROOT MESS, SAVE ON COSTLY REPAIRS!

Roots are just naturally thirsty. They force their way through joints in your sewer line, eventually clog it. Toilets and sinks "back up", soon overflow. Now you can avoid costly digging or mechanical cleaning this easy, permanent way.

Pour one box of revolutionary Hercules R-D into toilet bowl. R-D kills and decomposes roots permanently, often overnight. To keep sewer lines root free, apply R-D twice a year. Safe to handle. Safe in septic tanks. Don't wait for trouble. Get R-D now from your plumbing or hardware dealer. It works, or your money back. Only $3.95 for 2 lb. box. Send for literature.

HERCULES CHEMICAL CO., INC.
416 Broadway, New York 13, N.Y.

Mail For McCahill

[*Continued from page 50*]

● *Is it true that a lean mixture will result in overheating? If so, can this be explained?*

Robert Earl Bolton, M.D.
Wenatchee, Wash.

Try this: A lean mixture doesn't contain the firepower designed to be in the combustion chamber. A too-lean mixture will cause detonation and pinging which causes overheating. In other words, it's like trying to run a race horse that's been living on half the required food needed to keep him healthy. A lean mixture is a form of fuel starvation whereas a normal mixture has enough power to keep the engine relaxed in all normal use.

● *Can you please send me complete servicing instructions on the 1952 Packard automatic transmission.*

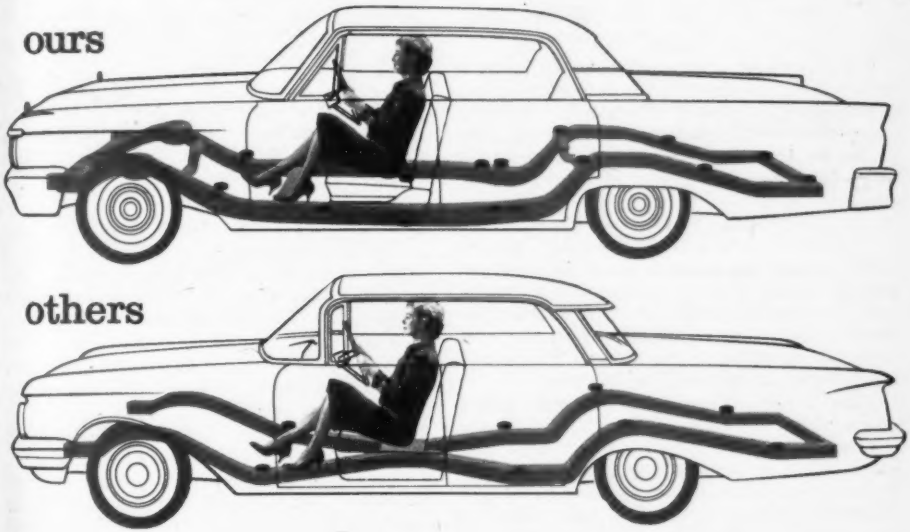
Phillip A. Cautilli
Philadelphia, Pa.

No.

[*Continued on page 54*]

DON'T DO-ITS

Which ride is quieter?



There are 50% more rubber body mounts in the 1961 Ford Family of Fine Cars

Ford Motor Company builds better bodies

• Rubber body mounts are used to seal out road and engine noise. They prevent it from being transmitted into the car. The more rubber body mounts, the more effective the sound barrier. In the Ford Family of Fine Cars, with 50% more insulating body mounts, you get a remarkably quiet ride.

• Also adding to the silence of the ride is extra sound insulation. In the Ford Family of Fine Cars there is up to 57% more area covered with sound absorption material.

• Millions of car frames are shaped like an "X." Weak in the middle, they can be twisted out of shape. Guardrail frames in our cars curve out. They are strong in the middle. This is true of Ford and Mercury. Guard rails also protect passengers in the unitized bodies of Falcon, Thunderbird, Comet and Lincoln Continental.

• Doors in the Ford Family of Fine Cars are stronger. They are braced with steel ribs. This means they are more rigid and therefore close tighter and quieter. They are less subject to distortion, reducing the likelihood of developing squeaks and rattles.

• These are four of the many reasons we think you will find (upon comparing our cars with other cars) that Ford Motor Company builds better bodies.

Ford

American Road, Dearborn, Michigan

FORD · FALCON · THUNDERBIRD · COMET · MERCURY · LINCOLN CONTINENTAL

[Continued from page 52]

● *McCahill, you're over the hill. I think the new, what you call "idiot lights" instead of instruments are great. I like the 14-inch wheels. I don't think the suspension on most cars is soft enough, and I think quad headlights are the best ever. Go back to your horse and buggy.*

Pete "The Modern Man"
Brooklyn, N. Y.

Differences of opinion have made many a bookmaker rich. Some modern designs reflect genuine advancements; others are just sleazy industrial substitutes for the real thing. One of the best examples I ever witnessed took place in a friend's home in Manitowoc, Wis., recently. Mary Rankin is beyond a doubt one of the finest amateur gourmet chefs in the United States. Her kitchen has every known ultra-modern convenience, each the most expensive made, from the automatic thermostatically-controlled wall ovens to the professional mixers, etc. A $10,000 bill might just cover the equipment, including all the latest-type electric skillets and coffee makers.

After a party one night, my wife and a group of friends entered Mary's kitchen for a good-night feast of scrambled eggs and bacon. What do you think she cooked them in? From out of somewhere she pulled two huge, old-fashioned cast-iron frying pans, black as the inside of a dinosaur. The bacon went in one and the eggs in the other.

When I asked Why?, Mary answered: "They've never made an electric fry pan yet that can turn out food like an old iron skillet." Ah, that's progress, I thought. By the same token, idiot lights will never take the place of real instruments *for those who know better* —and this goes for small wheels which wear out tires in half the time of the bigger ones. Ultra-soft suspension is actually unsafe.

● *Heading east on the Penn Turnpike during a drizzle, we stopped at a service station where the attendant cleaned our windshield with something that must have had oil on it. This oil just smeared and smeared as the windshield wiper worked and, pulling into the next station, we asked the attendant to change the wiper blades, feeling they were at fault. We were told that the blades were in brand-new condition, that the fault was an oil film. The attendant cleaned our blades and the windshield and off we went. In a few minutes the windshield was as smeared and oily as ever, so we left the turnpike at Carlisle, then pulled into another service station. We told the man there about our troubles. We had used, ourselves, our standard-type glass cleaner, so his answer was startling. "If you want to spend a dime, I can fix it for you," he said. We told him to go ahead. He went to the Coca-Cola machine, pulled out a bottle of Coke, poured it onto a clean cloth, wiped the windshield and wiper blades thoroughly with it and that was the end of our trouble! The windshield never looked so clean. How about that?*

Mr. and Mrs. Graham Place
Erwinna, Pa.

Now, if this isn't a hot tip for MI readers, you'll never hear of one. We tried it and it works!

● *On a trip I just took with my Chrysler 300F I often found it hard to buy good premium gas to keep it from knocking. I've been told that all good premium gas of any brand today rates 100 octane or more and this should be enough. But in some sections that gas seems very poor. I don't want to retard my spark timing to get along with a poor fuel but what else can I do?*

F. W. Barkley
Pittsburgh, Pa.

I had an experience with my own 300F that paralleled yours. On a story-gathering trip through the midwest, I found good fuel almost impossible to buy, especially in Wisconsin and Minnesota. Even in towns as big as Minneapolis, Milwaukee and St. Paul, if they sell any top grade premium fuel I was unable to find it and I damn near blew the top off my pistons. Many of these fuels are supposedly rated at 100 octane but this isn't true by many points. On two occasions I stopped at private airports and picked up some 100 octane aviation fuel which had the car going better almost at once. Some fuels marked Premium should cause the officials of the company to be arrested for misrepresentation because the 300F will run perfectly on 100 octane and can run without too much trouble on real 95.

On the east coast from Maine to Florida, and in the far west, it's as easy to buy premium fuel as to catch cold in a blizzard. If the government kids want something to look into, they might start checking the premium fuel racket. I realize that in many cases premium fuel is cut by the local service station operator but it's hard to believe this would be done by all of them. This is a serious situation because an owner without too much knowledge of automobiles could easily ruin a good high compression engine without knowing it.

—*Tom McCahill*

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Three 28-Page Books Compare '61 Cars—Packed with Easy-to-Understand Photos, Facts, Figures

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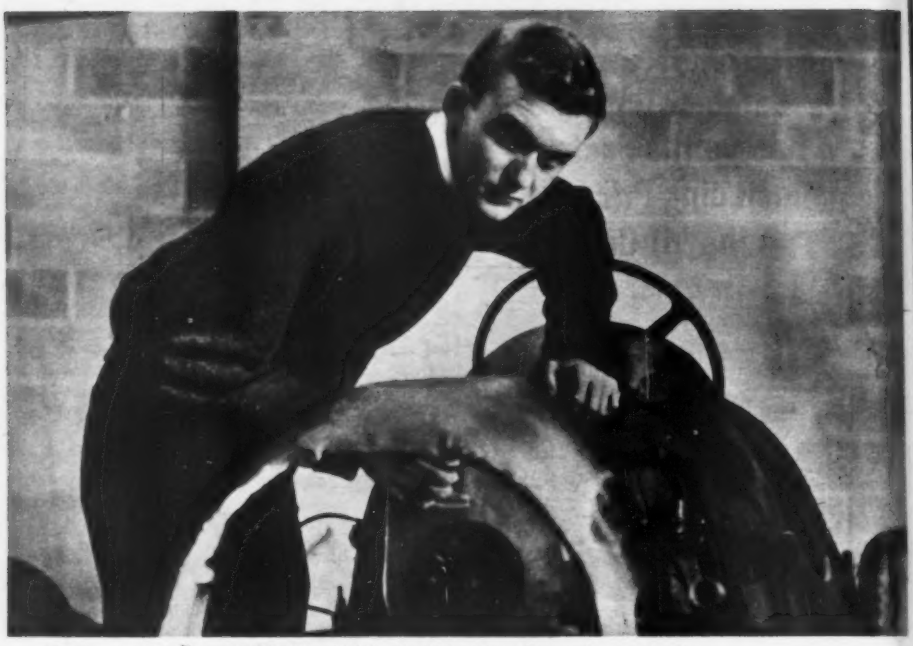
Get Your Free 1961 Automotive X-Rays at Your Rambler Dealer's Today!



18-year-old Ronald Satterfield of Atlanta, Georgia, asked...

"Where should I build for the future?"

Ronald Satterfield answered this question last year by joining the Air Force. This year about 100,000 young men will also choose this highroad to the future.

Many will become expert technicians in such fields as airplane and missile maintenance, radar, communications. The future will find others in supervisory positions in important support specialties: administration, supply, air police work.

Numerous personal benefits go with service in the Air Force. Steady advancement, the opportunity for more education, medical and dental care, thirty days' vacation yearly. Most important, the Air Force can help a young man prepare himself for the age in which he will have to make his way—the Aerospace Age.

Could this be the place for you to build for the future? Use the coupon below. There's no obligation.

U.S. Air Force

Airman 2C Satterfield whose civilian hobby was building "hot rods," is presently enrolled in a 45-week electronic computer course at Keesler Air Force Base in Mississippi.

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I am over 17 and a citizen (or resident) of the U.S.A. Please send me your illustrated booklet.

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MECHANIX ILLUSTRATED
April 1961

HOW TO BUY AND FLY YOUR OWN PLANE

PIPER COLT is two-place (side-by-side) aircraft powered by 108-hp Lycoming engine. It cruises at 115 mph, gets 18 mpg, has 100-lb. capacity baggage bin. The price is $4,495.

By Fred Bell, *Private Pilot's Certificate No. 1279115*

TO get the facts on private flying, the first sensible step is to visit your local airport and have a talk with the operator of the flight training school. You will learn that to become a student pilot you must be at least 16 years old. If you are over 16 but under 21, you will need the consent of one of your parents or your legal guardian. Secondly, you must be able to read, write and understand the English language.

If you qualify on these points, the operator of the flight training

BEECHCRAFT DEBONAIR is four-place aircraft that can fly 1000 miles non-stop at cruising speed of 180 mph. Plane is powered by 225-hp fuel-injection Continental. $19,995.

school will give you an application blank for a medical examination, and he will direct you to a local doctor (designated by the Federal Aviation Agency) who will give you a physical examination. The cost is ten dollars. After completing the examination, the operator of the flight training school will issue you a Student Pilot's Certificate, and you will be ready to learn how to fly.

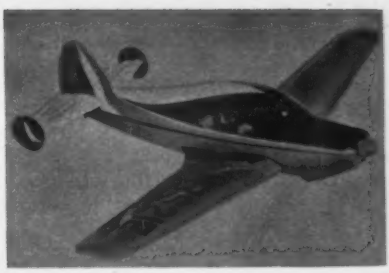
Flight training is divided into two major categories: dual instruction—during which you and the instructor fly the aircraft—and solo. Approximately 18 hours are devoted to dual instruction in which you will learn how to operate the aircraft, fly radio beams and navigate. You will also learn the fundamentals of instrument flying and you will be taught the procedures used in calling control towers and for flying cross-country. About 22 hours will be solo. You'll fly the aircraft alone, practice what you've learned and generally become more proficient at flying and navigation.

After you've completed the required minimum of 40 hours flight time (dual and solo combined) your flight instructor will give you a final "check ride" to see if you qualify for your Private Pilot's examination. If he feels you're ready, you will then be given both a written test and a flight test by inspectors from the Federal Aviation Agency. These tests will cover all that you've learned. They can be taken repeatedly if failed the first time.

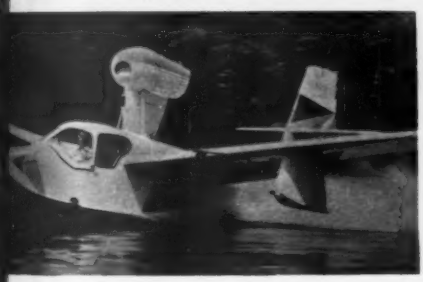
If you complete the tests successfully, you will be issued that long-awaited prize of prizes—your Private Pilot's Certificate. (By the rules of the game, you now owe your Flight Instructor one good bottle of bourbon!) Your Private Pilot's Certificate allows you to carry passengers (but not for hire) and puts at your disposal more than 3,000 airports in the United States.

Your Private Pilot's Certificate is issued free of charge and does not have to be renewed. It is good for life. Also, you do not have to fly a certain number of hours each month or each year in order to maintain your Private Pilot's status. If you abstain from flying for a few months, it is, of course, wise to take a "check ride" before you start flying again—but there is no requirement to do so. It is a simple matter of common sense. The *one* requirement you must comply with is to take a physical examination once every two years.

BELLANCA 260 is four-seater with 260-hp Continental engine. The cruising speed is 203 mph. Price is $18,990.



FORNEY AIRCOUPE is two-seater with 30-ft. wingspan. Powered by 90-hp Continental, craft cruises at 125 mph. Price is $7,450.



LAKE AMPHIBIAN is four-passenger, single-engine job. It has 180-hp Lycoming mill, does 131 mph for 500-mile range. $24,995.

MEYERS 200A has a fuel-injected, 260-hp Continental engine. Range is 1300 miles at 204 mph. Four-seater. Cost: $24,000.

I mentioned earlier that 40 hours is the minimum flight time a student must have before he can take his Private Pilot's examination. This 40 hours, however, can be accrued within a month's time or over the course of a few years. For obvious reasons, it is better to take your training as quickly as possible and not let too much time lapse between training periods.

The costs of flight instruction vary from airport to airport but the average cost of training to enable you to become a Private Pilot is between $350 and $400. You can pay this amount in advance (and receive a substantial discount) or you can pay by the hour as you fly. Your training aircraft will most probably be the Piper J-3 Cub or a similar two-seater training aircraft. Hourly costs will average $8 for solo time and $11 or $12 for dual time.

The costs of flight training can be decreased in numerous ways. You can buy your own Cub before you start your training and pay only $4 an hour for your instructor's time and about $3 an hour for gas, oil and depreciation. This gives you a total cost of $7 an hour for dual time and $3 an hour for solo time. A good used Cub will cost in the neighborhood of $1,500, and you will be able to sell it for about the same price after you've completed your training.

Joining a flying club is another method of lowering the cost of flight training. Student Pilots, and even Private Pilots, will often form a club and buy a plane. The Student Pilots

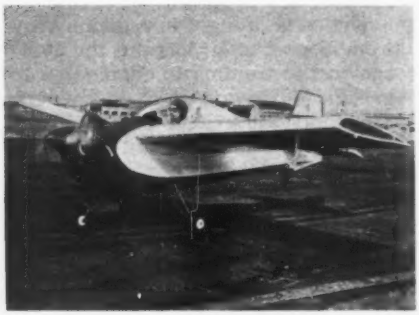
in the club use the airplane for training and the Private Pilots fly it for enjoyment. Most flying clubs will purchase an airplane in the $3,000 to $5,000 category. Depending upon the size of the club, the cost-per-member is usually extremely low.

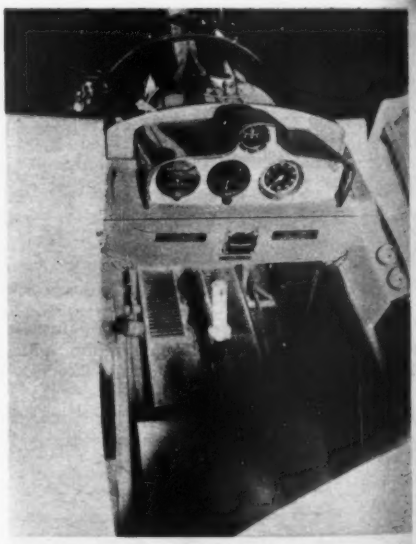
There is a great deal of public misinformation about airplane prices. We mentioned the Cub and the fact that a good used one can be purchased for about $1,500. The Cub seats two people, cruises at about 70 mph and burns about three gallons of gas an hour. (Aviation gasoline costs between 38 cents and 45 cents a gallon and, on a mile-for-mile basis, is usually cheaper than automobile gas.) The Cub is primarily a training aircraft and when a pilot has progressed to the point where he has, say, 100 hours under his belt, he will usually want to move into an aircraft which is faster and more comfortable.

Good *used* aircraft which seat four people and cruise up to 130 mph can be bought from $2,500 up. A brief list would include Cessna 170's, Stinsons, Bellanca's, Piper Pacers and Tri-Pacers, Aircoupes and many others. Within this group are high-wing, low-wing, metal, fabric, conventional gear and tri-cycle gear aircraft. You have a wide range of choice depending upon your individual taste.

In the $5,000 to $10,000 bracket, you can purchase newer, better-equipped, models of the aircraft already mentioned, or you can select from used Beechcraft Bonanzas, Cessna 172's, 180's and 182's.

The cheapest *new* aircraft you can





BELGIAN-MADE Nipper will soon be available in U.S. It has a 45-hp VW engine, 94-mph cruising speed, wingspan of 19 ft., eight in. It's a one-place aircraft with full instruments and tri-cycle landing gear. $3,695.

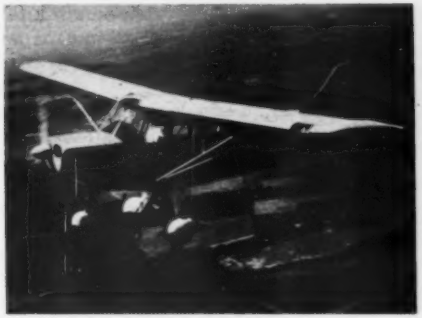
MOONEY MARK 20A is four-seater with 35-foot wingspan. It has 180-hp Lycoming engine. Cruising speed: 180 mph. $15,450.

purchase today runs about $5,000 and for a new Piper Tri-Pacer or Cessna 172 —the most popular lightplanes—you will pay between $8,000 and $11,000, depending upon model and equipment.

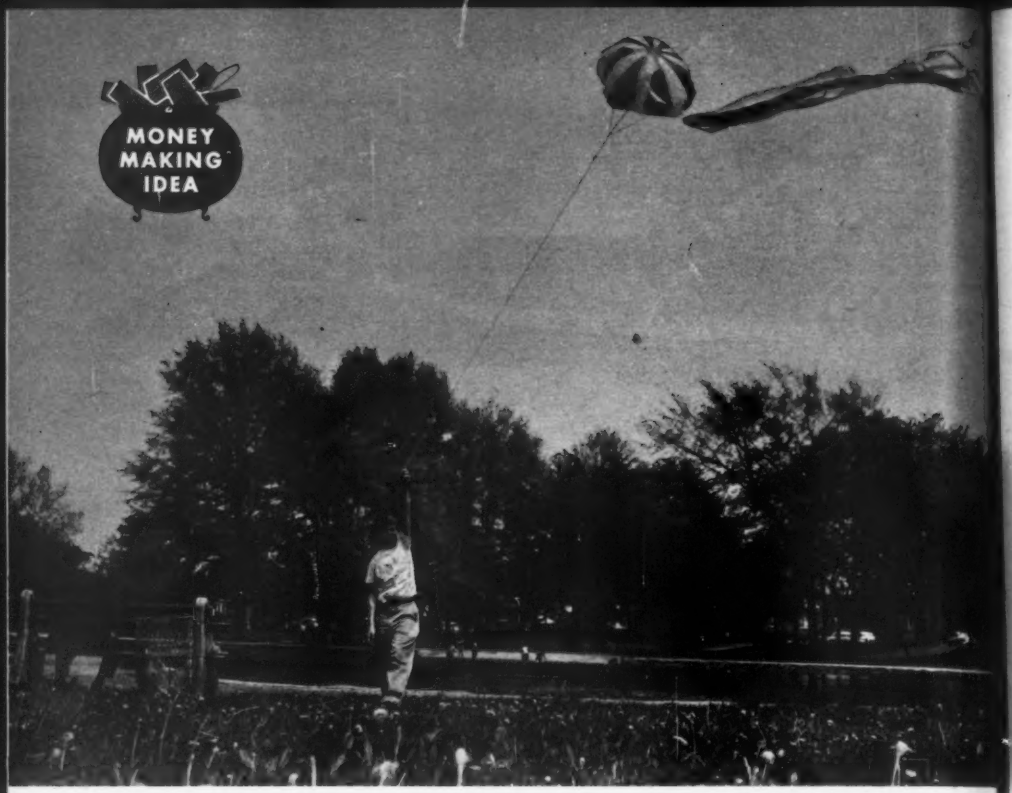
An important factor to remember about airplanes is that government-licensed inspectors see to it that an aircraft is airworthy before it is allowed to be flown. This Airworthiness Certificate must be carried in the aircraft at all times and must be renewed at regular intervals. This means, basically, that regardless of the price you pay for an airplane, it is thoroughly safe to fly if it has a current Airworthiness Certificate.

Nearly [*Continued on page* 166]

CESSNA 150 is two-seater with 100-hp Continental engine. It cruises 520 miles at 121 mph, weighs 1500 lbs. The price is $7,495.



CHAMPION TRI-TRAVELER seats two, has a 95-hp engine, cruises at 108 mph for 500-miles. Wingspan is 33 ft., five in. $6,695.



KITE FLIER flies a Hutson kite in a New York City park. Kites cost from 49 cents to $2.

NEW LOOK IN KITES

THE Hutson boys were great kite fliers back in Lubbock, Texas. Lubbock winds took their home-made kites high—and tore the paste-and-paper creations to bits. That was part of kite flying.

Years later, when Wayne and Alton Hutson were pushing the half-century mark, they recalled all the fun and trouble they had with kites. They knew that the kites that space-age youngsters bought cheap and put together were still fragile stick-and-paper devices. The Hustons reflected that there would be real money in it for anyone who could bring out a kite that was ready to fly, untearable and unbreakable. The more they thought about it the sounder this reflection [*Continued on page* 173]

KITEMAKER Wayne Hutson inspects one of the boneless kites in the shipping room.

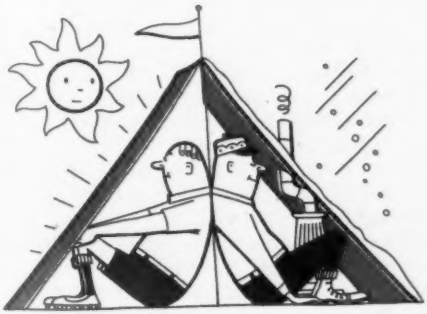
WIDE SURFACE IRON to save time and work, leave housewife free to cook more delicious meals. Dennis Lopez, New York, N.Y.

BIKE BACK REST, so lazy cyclist can lean back comfortably when not obliged to pump uphill. Jack B. Dews, Jr., Ft. Worth, Texas.

ELECTRIC OUTLET at the back of a barber's chair so chair can be swung while clippers are working. Jeff Clevenger, Abilene, Tex.

INVENTIONS WANTED!

Is there a gadget you think should be invented? If so, send its description on a postcard to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44th St., New York 36, N. Y. Each one printed will be awarded $5. Entries not selected cannot be acknowledged or returned.



REVERSIBLE TENT with one aluminized surface to reflect sun in summer, stove heat in winter. David W. Norgard, Madison, Wisc.

DISPOSABLE MOP HEAD of highly absorbent paper to eliminate rinsing after every mopping-up job. John Heffly, Denton, Tex.

THEY'RE ROLLING IN MUSIC

NO HANDS on the keyboard. Broadway actress Pat Finch rolls out an old favorite for some friends. As she pumps, a vacuum is formed; perforations in the roll admit air to ducts controlling the piano keys.

ARRANGER J. Lawrence Cooke has been arranging for Imperial for a tuneful 37 years.

ONCE there were two dozen makers of player piano rolls in the U. S. From 1914 the business grew and grew until 1926; from then on radio and the depression began to take their tolls. Today only one of the old firms is still punching out roll music—the Imperial Industrial Co., Bronx, N. Y.

The factory is all on one floor; a handful of employees turn out the rolls. A catalog of 2000 pieces include oldies, hymns, carols, and modern stuff played and arranged in a modern way. Max Kortlander, who founded the firm in 1914, runs it with his brother Herman and a partner, Oscar Dahloff, another oldtimer who once owned the International Player Roll Co.

PERFORATOR makes 32 copies simultaneously. Master roll is top center, above the copy rolls.

STENCILS of words are made from master roll. Equipment goes back to the old days.

WORDS are stenciled on rolls by hand; perfect coordination aligns words with music.

The most complex part of the business is the arranging. J. Lawrence Cooke, who has been arranging for Imperial since 1923, does it on an instrument with a full piano keyboard and a foot lever that punches the total sound for each beat into the master roll. Copies are made from the master, then the words are stenciled on the copies. Each syllable of the lyrics is hand-placed next to corresponding perforations. Then the rolls go on their spools, into their labeled boxes and out to the remaining home player pianos and coin-operated instruments of the nation. •

FOUNDER Max Kortlander runs 46-year-old firm with his brother and an old ex-rival.

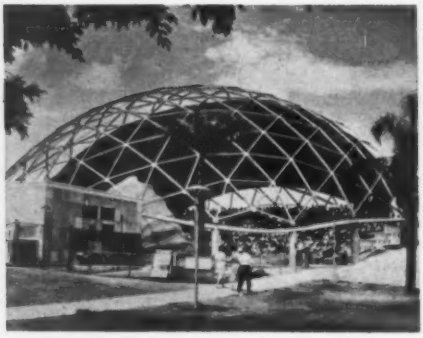
HERE'S THE FACELLIA

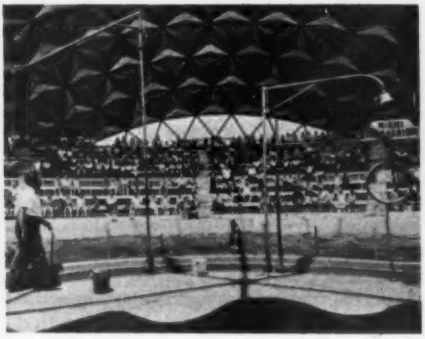
ENGINE and gearbox are up front, car has rear drive. A luxury car of modern styling and design, Facellia sports all stainless steel trim, beautifully quiet fins and exposed wheels.

FACEL-VEGA, a car-building firm founded in 1939 in Paris, has brought out a new sportster that will hit the U. S. bearing a $3,995 tag. This buys a modern four-cylinder mill that will tug the buggy at 114 mp, unibody construction, individually adjustable seats. Facellia comes as a convertible, convertible hardtop, fixed-head coupe. •

GOLD-DOMED SEAQUARIUM

MIAMI got a new landmark when the Seaquarium put a sunshade dome of Kaiser gold-anodized aluminum struts and panels over the arena where the porpoises disport themselves for the tourists. The structure is 57 feet high, 145 feet in diameter, weighs only 45,000 pounds. The panels are not meant to keep off the rain—they are set half an inch apart and the southeast and northwest sections of the dome are left unpaneled to allow free passage of breezes. A huge ring of concrete buried five feet deep anchors the lightweight dome. •





SUNSHADE lets light in over the stage and porpoise pool, keeps the audience out of the tropical sun. Above, porpoise fields a thrown object for an audience of tourists.

IT'S NEW!

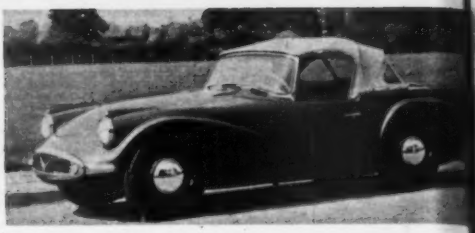
WORLD'S FIRST swing-tail plane permits straight-in loading of cargo. Controls to rear run under floor and are reconnected when tail is shut.

LYNX sports car is a luxury four-seater capable of 115 mph. Anybody with $5,600 can buy this six-cylinder British beauty.

HANGOVER HAT aids morning-after heads. Sealed-in fluid stays cold in this plastic chapeau. Keep in freezer for emergencies.

CONTINUED . . .

WOW! What a . . . chair? It's fireproof, of pressed, chemically-treated wood laminate. Flaming gasoline on seat won't singe it.



DAIMLER SP250 sports car features hydraulic disc brakes on all four wheels, bucket-type front seats and a roomy trunk.

"MUSIC TYPEWRITER" copies sheet music speedily and accurately. It was invented by Murray Parker of Melbourne, Australia.

NEW SCOOTER ENTRY—the Nobletta—is a three-wheeler. Statistics: over 100 mpg; 35 mph; seats two; has baggage space; $275.

LADY ASTRONAUT? No, she's wearing the latest thing in surgeons' masks. It eliminates all bacteria exhaled by the wearer.

ITCH HERE! Electric back-scratcher that vibrates 3,000 times per minute. You can get them in pink or ivory. Then relief is just . . . an outlet away. Priced at $5.23.

Damar's, 545 Bloomfield Ave., Montclair, N. J.

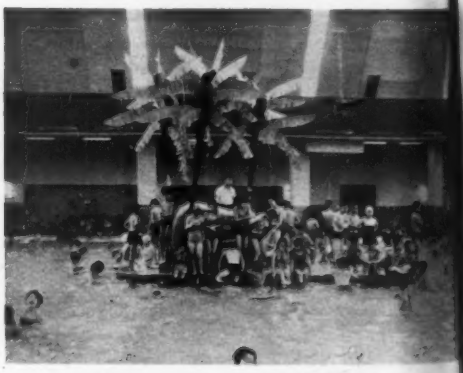
GLUE—a special plastic type—is being used in Hamburg, Germany, to secure subway track to the ground. If successful, this method could cut costs considerably.

NEW GUN of British make has been ordered by U. S. Defense Department for our giant M-60 tank. The design of this big 105mm weapon features an easy-to-remove barrel.

WORLD'S LARGEST INDOOR POOL

Amid a tropical scene, Hawaiian bands serenade the customers of this gigantic Japanese swimatorium.

TOKYO now boasts the world's largest indoor swimming pool. Built at a cost of over $2,500,000, this converted skating rink measures 110 by 220 feet and accommodates up to 2,000



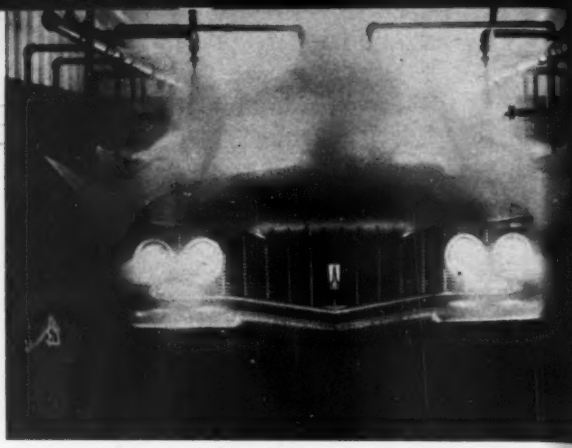
SWIMMERS take over the island bandstand in center of the pool during intermission.

swimmers. On an island rising from the middle of the pool, Hawaiian bands take turns playing for the entertainment of the bathers. Facilities include lockers, dressing rooms, shower room and snack bar. Rubber boats, floating rings, aqualungs and beach balls may be rented. The pool is open to anybody with the yen—or rather 100 yen (28 cents)—to swim. •

WATER-SKIING exhibit shows off size of pool. Water is four feet deep at all points.

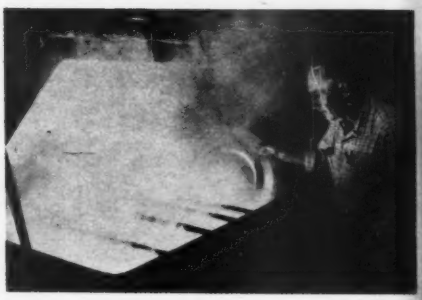
PRICE of admission is 28 cents. In the winter the pool is used as a skating rink.

THEY TORTURE CARS



EVERY PLYMOUTH gets this hurricane-force water test. Workers inside the car check weather sealing around the doors, windows and trunk.

HIGH-SPEED ROLLS inflict damage which is carefully studied by the car-improvers.

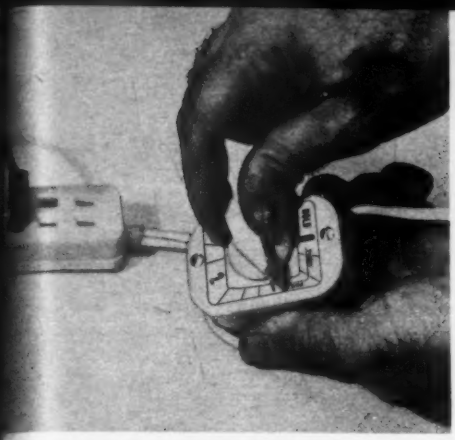


SALT-SPRAY CABINET tests the resistance to pitting of cars' stainless steel parts.

HAMMERING this new hood-lock assembly will help determine quality of its metal.

ANY working day, visitors at Plymouth assembly plants can watch brand new car parts being systematically destroyed. "Startled" is the word for their expressions as they observe a man cutting metal slugs out of bumpers; a machine rubbing seat fabric with carborundum; stainless steel moldings being subjected to concentrated corrosion-inducing salt fog; bushings being baked in 200° F. ovens. For all this calculated vandalism serves a purpose: improving the quality of the manufacturer's automobiles.

The Materials Testing Laboratory in each Plymouth assembly plant has ovens, cold boxes and humidifiers in which artificial weather conditions can be created to determine the effect they have on all parts of the car. The company's "breed improvers" may subject a car to 1,500 tests in a single month. •



DIAL is marked off in quarter hours and hours up to four hours. Note three sockets.

BRIGHT IDEA AWARD MECHANIX ILLUSTRATED

EXTENSION CORD TIMER

YOU may forget to turn off an appliance but the new extension cord timer will remember—if you remember to set it. Most users want the timer to turn things off after they go to sleep—the bedtime TV show, radio program or reading lamp, for instance. A more technologically advanced person will use the three sockets to run the music-maker, the fan and the electrical massage unit all at once—with the happy knowledge that when he wakes up these three electrical slaves will not still be inappropriately on. The switch "remembers" for four hours, is cream-colored, has a six-ft. cord. Maker of the timer is M. H. Rhodes, Hartford 6, Conn. $6.95. •

VERSATILE device can be used with any appliance, also serves as plain extension.

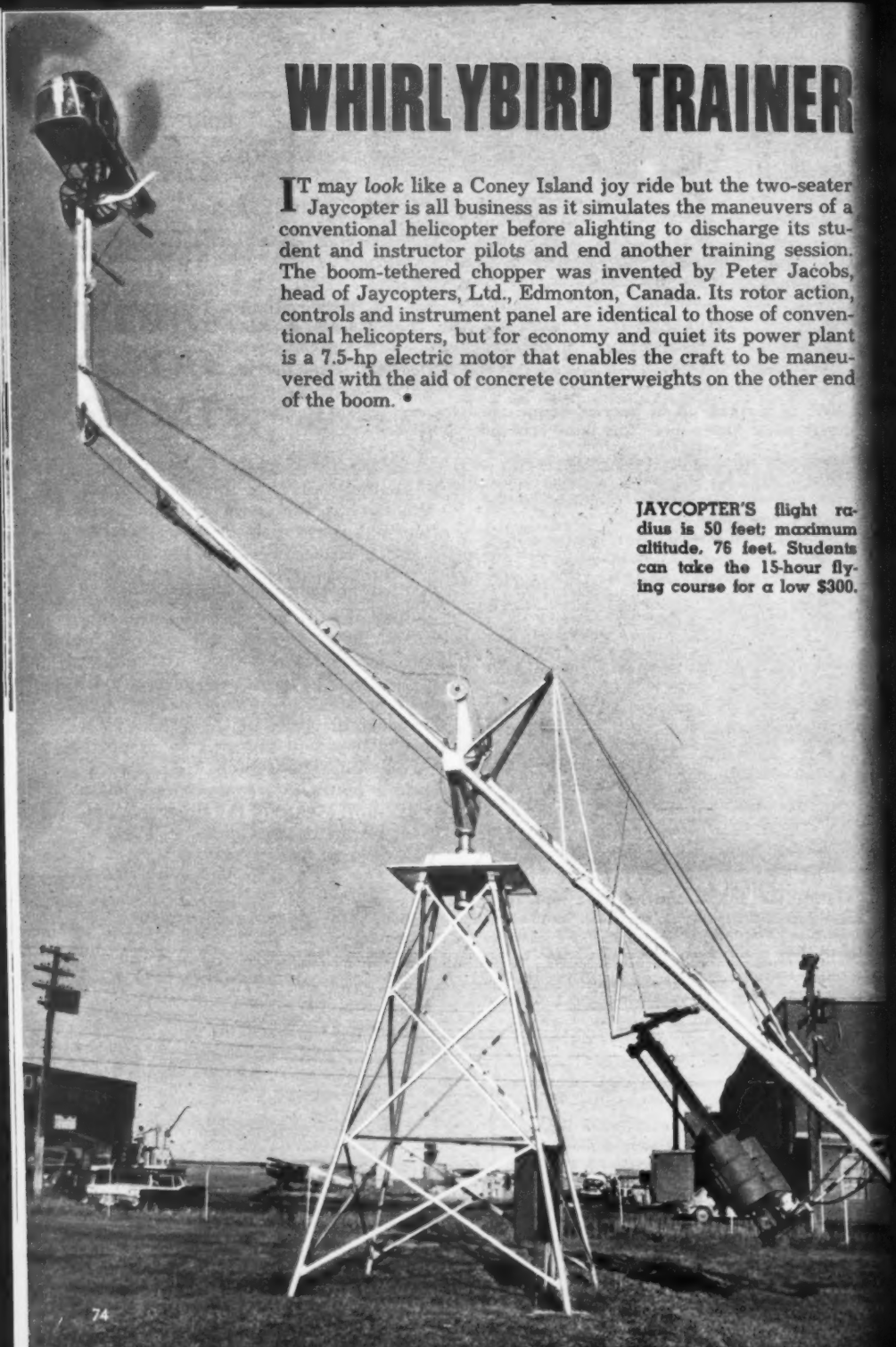
LULLABY listening can be indulged in if you use the timer—the radio will turn off.

WIN $50

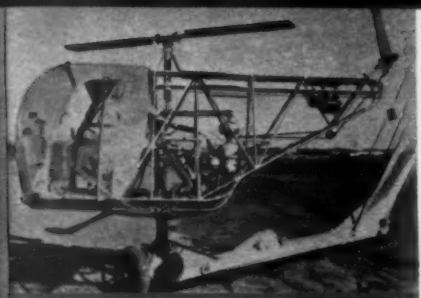
MI will award $50 each month to the first person who tells us of a new and useful gadget that is patented and in production. Manufacturers are also eligible for this award. Pictures and a description should be sent to Bright Ideas Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y.

WHIRLYBIRD TRAINER

IT may *look* like a Coney Island joy ride but the two-seater Jaycopter is all business as it simulates the maneuvers of a conventional helicopter before alighting to discharge its student and instructor pilots and end another training session. The boom-tethered chopper was invented by Peter Jacobs, head of Jaycopters, Ltd., Edmonton, Canada. Its rotor action, controls and instrument panel are identical to those of conventional helicopters, but for economy and quiet its power plant is a 7.5-hp electric motor that enables the craft to be maneuvered with the aid of concrete counterweights on the other end of the boom. •



JAYCOPTER'S flight radius is 50 feet; maximum altitude, 76 feet. Students can take the 15-hour flying course for a low $300.



IT LOOKS and flies like a conventional helicopter. A pneumatic ram in the boom makes the rig crashproof.

INTERIOR of Plexiglas cockpit has instrument panel and dual controls for the instructor and his student.

AFTER TAKE-OFF the pilot can maintain a stationary hovering position, move forward, climb, descend, land.

NEW TANK KILLER

THE Vigilant, a wire-guided anti-tank missile developed in Britain by Vickers-Armstrong Ltd., has been ordered by the War Office for assessment trials. Designed primarily for the infantry, the weapon weighs 45 pounds and can be carried and operated by one man. It has a range of about one mile and can be put into action at a moment's notice by means of an extremely easy control system. Photos show a paratrooper ready to jump with one of the missiles, and (below) an infantryman demonstrating the Vigilant during a field trial. •

the all-new SCOUT

"It's a helluva buy," says Uncle Tom after a rugged wring-out of International Harvester's unusual "all purpose" vehicle.

By Tom McCahill

LEWIS and Clark would have given at least 87 beaver pelts and their last axe for one of International Harvester's new "all-purpose" Scouts. The 100-inch wheelbase Scout comes in either a two- or four-wheel-drive package, offers several body combinations and, unlike most light-duty vehicles of its kind, can be had in any one of five standard colors (red, metallic green, metallic blue, yellow or tan).

The Scout has more innovations than a Chinese New Year's punch and lots of little features never seen before in this type vehicle. The standard steel cab top can be removed by taking off ten easy-to-reach bolts. The full-length steel Travel-Top, which encloses both the driver's compartment and the payload space and which can be bought for an

TRAVEL-TOP has side and rear windows. It can be purchased for additional $128.52.

UNCLE TOM poses with two models of Scout. White-bodied job in rear with a standard steel top is 4x4 rig. One in front with whitewall tires has a two-wheel drive.

extra $128.52, requires the unwrenching of a mere 21 bolts to remove the whole thing including the rear door and window. Both side doors on the Scout can also be removed easily by taking out the specially-designed hinge pins. In addition, the windshield can be folded forward, making the Scout an excellent hunting or reconnaissance car. Also available as an extra on the four-wheel-drive job are two species of snow plows and an "Angledozer" in case you have the urge to push earth around with your Scout.

I've been a four-wheel-drive nut for years, as I do a lot of hunting and backwoods exploring whenever I get the chance. For this work the Scout has an added feature rarely found in other 4x4 rigs. For an extra 35 bucks it (as

SCOUT equipped with Travel-Top has cargo space five feet long, 54 inches wide at top.

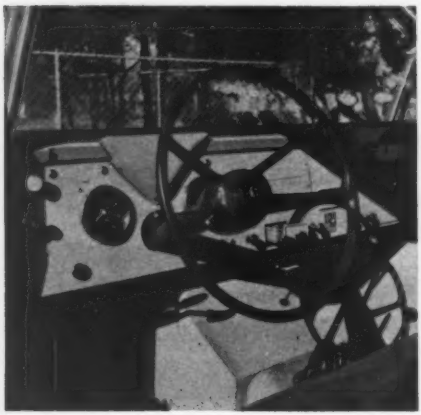
TEST CAR SPECS

MODEL TESTED: **International Harvester Scout (4x4)**
ENGINE: **4** cyls; **152** cubic ins; **86.9** brake hp; **135** ft-lbs max torque; **8.18** to 1 compression ratio. Bore **3⅞** ins; stroke **3 7/32** ins. Fuel required: **Regular.** Standard axle ratio: **4.27.** Wheelbase **100** ins; length **154** ins; height **68** ins; width **69.6** ins; front tread **53.88** ins; rear tread **53** ins. Weight **3,000** lbs. Gas tank capacity **11** gals. Turning circle diameter **43** ft. Tire size **6.00X16.**
PRICE (without optionals): **$2,128.34**
PERFORMANCE: 0-30 mph, **7.0** secs; 0-60 mph, **22** secs. Top speed **71** mph.
All times recorded on corrected speedometer.

well as the 4x2) can be ordered with a Powr-Lok rear axle, which is known to many as a "limited slip." I asked why this couldn't also be available for the front axle which would then make the car a true four-wheel drive. They told me that the front-axle manufacturer thought the stress might be too much and wouldn't guarantee it.

Anyway, in a four-wheel-drive Scout equipped with Powr-Lok you do have positive three-wheel drive, which is one more than I get with my Jeep or Land Rover. On several occasions I've been mired in bottomless goo with both my Jeep and Land Rover when the left wheels, front and rear, were spinning while the right wheels remained motionless. For our six readers in Kasavubuland who aren't hip to such things, let me explain what this is all about. My Land Rover, when traveling in a straight line on a dry road in four-wheel drive, has drive force at all four wheels. Thus, the only time I have real four-wheel drive is when I don't need it! This seems pretty silly but those are the facts, ma'am. When the going gets gooey, icy and rough, the only assurance I have is that one wheel in the front and one in the rear will turn, and not in any particular order. The 4x4 Scout with Powr-Lok can guarantee you three-wheel traction forward, which is a 50 per cent improvement.

Two Scouts were sent to me in Florida: one a four-wheel drive with the standard steel cab top, the other a two-wheel twirler with the full-length Travel-Top and whitewall tires. These jobs, à la Pontiac Tempest, are powered by a 152-cubic-inch, four-cylinder mill, actually the right bank of the big International Harvester V8. Like the Temp-

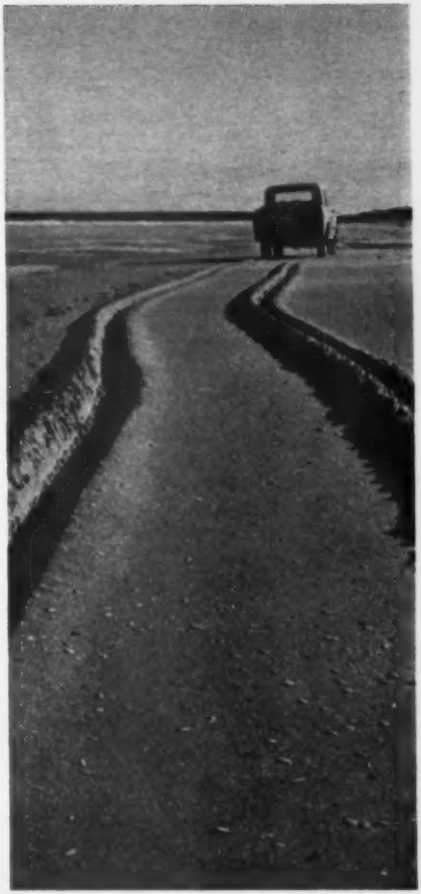


FITTINGS are "pleasant but not posh," Tom says. He suggests shorter steering post.

FOUR-WHEEL-drive job revealed plenty of boff in a rugged climb over sand dunes.

est, which uses half of a Pontiac V8, many Scout parts are interchangeable with the International Harvester V8's, making service from coast to coast fairly simple.

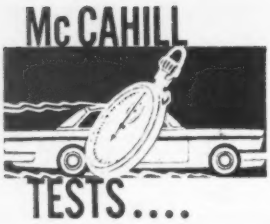
My particular interest was in the four-wheel-drive job which lists at $2,128.84 F.O.B. Fort Wayne, Ind. (Factory price of the two-wheel-drive model is $1,750.84.) Unfortunately, the Scout they sent me wasn't equipped with Powr-Lok—and the tire size of 6.00 x 16 was not too good a choice; a 7.00 or a 7.50 tire would have given a lot more traction. Now, we had been experiencing a dry spell in Florida and there were no mucklands wet enough for a good traction test, so I headed up the beach from Daytona until we started hitting what they call locally a "coquina" surface. Unlike the anvil-hard sands of Daytona Beach, just a few miles north at certain times a coquina covering four to six inches thick seems to make a pocket over the hard sand underneath—and there is usually water in between. Coquina consists of coral, shells and various other little nasty things. It doesn't pack like sand and when you get close to the water it bears a certain resemblance to thickened quicksand. In other words, you can stand still with both feet planted on this stuff and without moving a muscle you'll be in water up to your shins in a matter of minutes.



DEEP TRACKS show Scout's ability to plow through sand, even using standard tires.

TUG-OF-WAR between Scout and Jeep (chained back to back) ended up in a tie.

It was toward this stretch of coquina that we headed. I took the Land Rover along as a rescue car. As long as we kept up a head of speed, meaning 25-30 mph, we glided over it, only making tracks an inch or two deep. The slower we went, the deeper we sank—and this was my undoing. As the coquina started to get worse, I made a slow loop toward the ocean in order to turn back. This brought me to a narrow sluice where water was running off. To avoid bathing the brand-new Scout chassis in a spray of salt water, I slowed down to about four to five [*Continued on page* 163]



the BUICK

"The best car this famous marque has ever built," says Tom of the Invicta.

By Tom McCahill

THE 1961 Buick Invicta is a gentleman with dynamite in both fists. Our test car was as silent as Christmas Eve in the morgue and the ride as lush as a swim in egg drop soup.

This car was shipped to us in Florida and we've had it just about a month. The Invicta is the medium-size Buick with the full-size, hairy-chest

UNCLE TOM put the Invicta into some long, hard slides and full spins on Daytona's famous beach; he found "it was simple to get back on a straight course" with a minimum of corrective steering.

TEST CAR SPECS

MODEL TESTED: **1961 Buick Invicta four-door hardtop.**

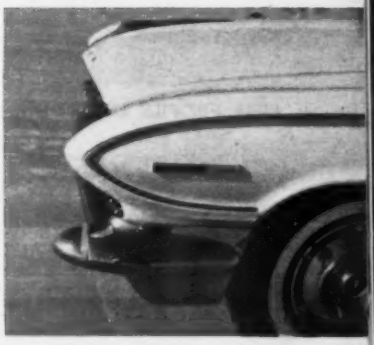
ENGINE: **V8** cyls; **401** cubic ins; **325** brake hp; **445** ft-lbs max torque; **10.25** to 1 compression ratio. Bore **4.1875** ins; stroke **3.94** ins. Fuel required: **Premium.** Standard axle ratio: **3.23.** Wheelbase **123** ins; length **213.2** ins; height **56.2** ins; width **78** ins; front tread **62** ins; rear tread **61** ins. Weight **4,179** lbs. Gas tank capacity **20** gals. Turning circle diameter **45.6** ft. Tire size **7.60X15.**

PRICE (without optionals): **$3,515.**

PERFORMANCE: **0-30** mph, **3.5 secs**; **0-60** mph, **8.0 (L); 8.2 (D)** secs; **40-60** mph, **4.8 secs.** Top speed **120** mph. All times recorded on corrected speedometer.

HEADLIGHTS this year nestle in a straight, not a concave grille.

REDEYES are bigger this year, oval instead of round. Also, the soaring fins of '60 are no more.



STRIVING front-end profile gives a hint of the 120-mph charge the car is capable of.

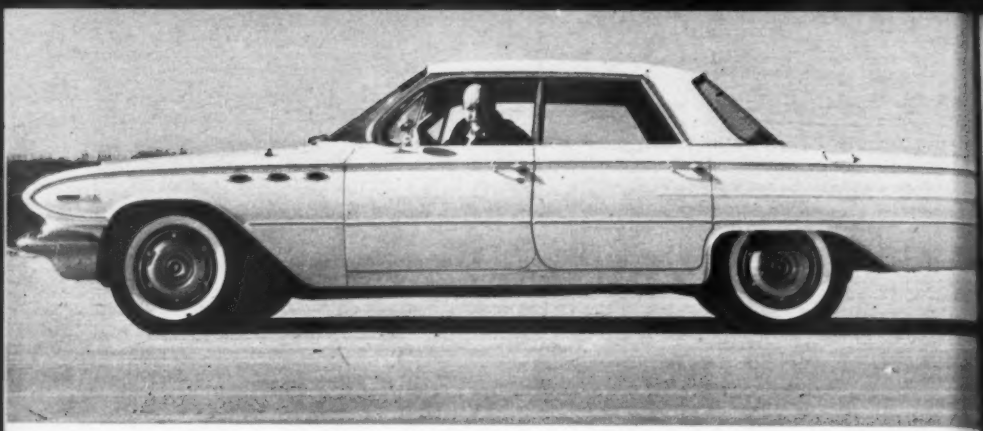
engine. The 401-cubic-inch V8 power plant is identical to the mill used in the 1960 Invicta that traveled 10,000 miles in less than 5,000 minutes at the Daytona International Speedway a year ago. This was one of the greatest endurance feats ever accomplished by a stock car but due to gooey Automobile Manufacturers Association regulations, Buick wasn't allowed to publicize it. I wrote it up on these pages at the time.

Our test car was a four-door Invicta hardtop with beautiful extra-cost red leather upholstery. Oddly enough, despite this lush extra, the rest of the car was the Plain Jane model with nearly all the expensive extras left out, such as power seat, power windows, air conditioning, etc. Some of the extras that come as standard equipment, however, deserve a solid round of applause. For example, the 1961 Invicta features a trip meter, something that went out on many American cars because it cost a few cents more. When manufacturers start dropping such items as the very useful trip meter in order to save a few pennies, you can just imagine what they're dropping from the rest of the machine where you can't see it.

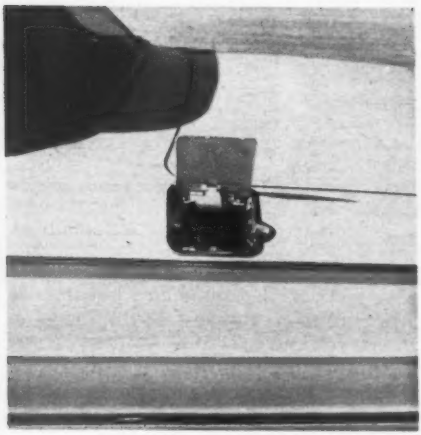
Another big feature of the '61 Buick are the 15-in. wheels which mean more tire life and greater safety than the 14-in. skins which Detroit is trying to force down our throats. A new one for Buick this year is key starting—no more turning on the switch and hoping it catches when you floor the gas pedal. All seats, front and rear, feature armrests, and the floor is well carpeted.

Appearance-wise, the Invicta seems much smaller than last year's model for a simple reason: it *is*. It is four-and-a-half inches shorter, one inch lower and two inches narrower, yet it still sports the same 123-in. wheelbase. This gives the car a functional, "compact" look—though it is quite a few notches larger than the cars which bear the "compact" label. The lines are neat and uncluttered. Unlike the 1960 version, the fins have been trimmed off and all useless architecture has been removed.

The first thing that hits you right be-



FULL PROFILE shows clean-sculptured lines of a body free of "useless architecture."



SNOUT of Invicta's 20-gallon gas tank is under lock-down lid of left rear fender.

LOW transmission hump leaves plenty of foot room for the front-seat passengers.

tween the ears, after you've driven this car for a few miles over some shoddy roads, is the absolute silence and absence of former built-in squeaks and rattles. Rattles and squeaks have become so common in American cars that I was beginning to feel they were part of The American Way—but now for the second month in a row I get a silent American car. (Last month it was the Lincoln.)

In our month of testing the Invicta, it was used for all types of normal chores such as going to market, hustling a dog to the vet's and just plain business travel. As I stated in the lead, this car is a gentleman [*Continued on page* 164]

HARD STOPS on Daytona Speedway proved to Tom that Buick's brakes are still great.

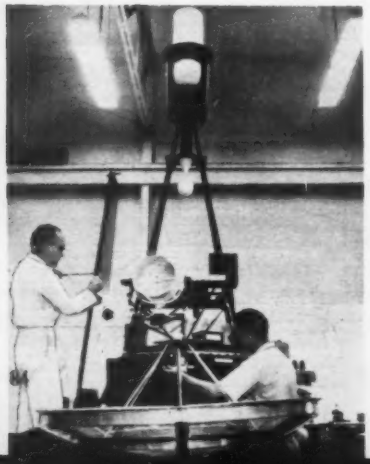
mimi

EVERYTHING you'd want in a shipmate adds up to MIMI, according to some of her followers, and here's what MIMI likes in an outboard motorboat: an Evinrude Lark III 40-hp motor with automatic choke for sure starts, Cruis-Throttle for more mpg, capacious remote gas tank, Evinrude Simplex controls. Seaworthy glass fiber dory is made by Holmes Fiberglass, Santa Ana, Calif.

TODAY IN SPACE

WHAT'S THE MOON MADE OF?

DRAWING shows retro rocket slowing lunar capsule 20 miles from the moon. Photograph shows model of Ranger.



WHETHER or not the moon is made of granite, meteorite-type rock, green cheese or sourballs will be known with scientific accuracy in 1962, according to Dr. A. R. Hibbs of the National Aeronautics and Space Administration's Jet Propulsion Laboratory, Pasadena, Calif.

The moon's composition will be revealed by the successful landing there of an instrumented space vehicle known as Ranger A. It will carry a 12-inch telescope through which pictures of the earth will be taken and transmitted back. If the moon has radioactive materials, instruments will also reveal this to earth monitors. Most important, the Ranger will take a gamma ray spectrum of the moon, checking for potassium content. [*Continued on page* 171]

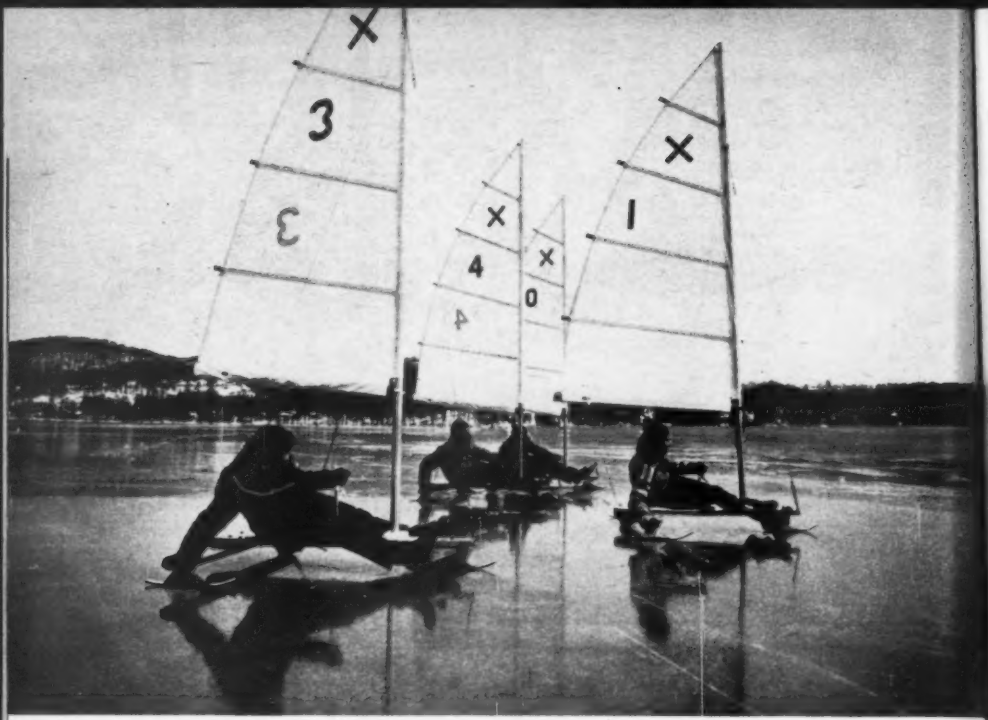
DIAL 88 for coffee—and the percolator begins to perk or, in the middle of breakfast, to hot up a bit.

DIAL-EVERYTHING HOUSE

BOB STOFFELS, an electrical engineer with Automatic Electric Company, Northlake, Ill., has equipped his new house with a dial-everything wiring system. Lights and outlets on the 110-volt house current are controlled by solenoids. The solenoids are jolted by a completely separate 24-volt system that employs two miles of bell wire. The control setup allows Stoffels or his wife Jan to dial the lights or appliance on or off at any of three phone dials in the house. To a main frame (like a phone company's) run wires from switches and wires from outlets and lights; circuits are closed by the dial equipment. Stoffels can rearrange his lighting circuits at the main frame without disturbing any wires. •

EASY DOES IT—when Jan figures it's time to start up the washing machine, she dials.

MASTER CONTROL gets a checkout from the master, who made his own test device.



RACING ICEBIRDS at 20 knots in a light breeze is great sport, fine for novice skippers.

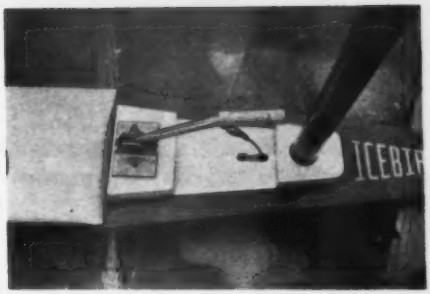
MIDGET ICE BOAT

STEERING is done with the feet; front runner gives direction as Icebird skims along.

OUT on the glassy black ice the hottest news is the new Icebird, a baby ice boat for anybody—new ice skipper or slightly used—who feels he needs a skimmer that can be handled by one person of moderate strength. The Icebird's designer is Patrick Ellam of Mamaroneck, N. Y.

Ellam's new ice boat carries only 35 square feet of sail, does 20 to 30 knots in light winds. In anything under a gale it can be handled nicely by a beginner. Its small size and aircraft-style control make it a nimble rig that can be raced on fairly small sheets of ice. Take two or more Icebirds to any decent-sized pond, set out markers and start racing—it's miniature sport but, like kart racing and penguin racing, it has the essential thrills. Complete with battened nylon sail and heavy-duty chrome-plated runners (to eliminate constant sharpening) the boat sells for $295. •

CONSTRUCTION is sturdy—hull of Sitka spruce, stainless steel rigging, nylon sail.



AIRPLANE CONTROL links to the sheet—the line that hauls in or lets out the sail.

LIGHTWEIGHT hull carries easily, can be folded to go into car trunk. While any full-sized ice boat takes a team of strong men up to 40 minutes to assemble, the Icebird takes a mere five minutes.

OUTDOORS with W. Scott Duncan

tips on WET-FLY FISHING

FISHING guides dread the angler who insists on casting nothing but dry flies when the fish are feeding deep. The guide knows his dude is going to have poor luck. He'll go home blaming the country and the guide; if he had fished wet the chances are he would have taken some good trout and gone home praising the fishing and the guide.

Nobody loves dry-fly fishing more than I. But I have more to do with my time than beat the water all day with dry flies when I know trout are searching the bottom for food. How can you tell when trout are feeding deep? First I suggest that you watch the water carefully when you arrive. Study the tails of the pools where the stream is shallow, look along the banks just under the overhanging bushes. In riffles watch the pockets between the rocks. Look for signs of fish taking insects off the top of the water. If you see no such action, you can bet that the trout in that stretch of stream, at least, are either not feeding or are taking their food on the bottom.

An expert can sometimes induce a few trout to rise to dry flies by creating a false hatch—casting for half an hour or so in one place. But the beginner will have more fun by going wet.

How do you know what flies to use when trout are feeding on the bottom? A good clue can be found by wading into the stream and holding a fine-meshed net to the bottom for several minutes then lifting it. Examine the contents thoroughly. The nymphs that are most numerous in your catch should give you an idea of what fly to use. Another clue can be found by catching a trout, slitting open its stomach and looking at what the fish has eaten. Usually the stomach will be full of nymphs, some not yet digested. Once you have a good clue, look through your fly book and select a fly or flies that resemble the natural insect in size, shape and color and you should be on the right track.

FISHING string of three flies, author keeps a tight line as flies float down current from far bank.

However, as important as physical imitation of natural trout food is, simulation of action in the water is of even more value. I have repeatedly seen trout ignore fine imitations of nymphs and drowned flies when not presented properly, then whale hell out of the same imitations when fished correctly.

Since beginners have trouble imitating the action of natural aquatic insects with [*Continued on page* 168]

LOOK WHAT YOU CAN LEARN FROM RECORDS!

By Ed Nanas

LIVING-ROOM learning is the latest of America's do-it-yourself kicks. All it takes is a record player, the will to learn and that set of platters that was created to teach you anything (almost) you want to learn—be it ballet or bongo, Chinese or cha cha cha, typing or tap dancing . . . somebody has put it on wax.

Over 50 manufacturers are in the business of recording such interesting sounds as the dits and dahs of International Morse Code, Russian vowels and rough systolic heart murmurs. You can get $400 worth of golf secrets on one long-playing record that sells for just under $4—not bad at a penny a secret! A complete 40-lesson course in the Russian language is available on a set of records that sells for $9.95.

For many, the convenience of learning "off the record" is an even more attractive factor than the really small financial investment such learning entails. For one thing, you don't have to leave the house and trudge off to school. Abed with a cold, you go right on learning between lozenges.

With these talk-and-teach records you

HOW TO GOLF. Tommy Armour's eight-lesson LP disc will enable you to cut up to eight strokes off your game (so the jacket says). Instructions cover everything from stance and grip to lengthening your drives and making more accurate putts. This record is marketed under the Grand Award label and sells for just under $4.00.

can take your Russian or French or Spanish (you name the language) lessons any time you feel like it. You progress according to your own determination and ability and can review a lesson whenever you wish simply by flipping over the disc.

Some of the lessons are just plain fun, such as Fiesta's cha cha cha instruction record. The basic steps are narrated in a straightforward manner by Lucille of the Tony & Lucille Dance Studios in New York City. This record, like most in the transcribed instruction group, contains plenty of practice material (in this case music) for the beginner.

Tommy Armour, who has batted golf balls around with the best, narrates a disc for Grand Award Records full of valuable fairway advice. His remarks are punctuated with 19th-hole anecdotes that bring home his points. This record aims at cutting up to eight strokes off your score in a month. Methodically, Tommy proceeds through the essentials of selecting clubs, putting, timing, stance, etc. His philosophy is that the most important thing is *your own* golf game, not fancy speeches on the subject.

LET'S SING SONGS in Spanish or French. Each of these 12-inch LP's (Cabot) includes a booklet translating all the songs. $4.95.

So Tommy talks as straight as he drives.

How To Ski by Skico Company won't make you the scourge of the ski trail, but Olympic skier Gladys (Skeeter) Werner gives out with enough terminology and fundamentals so that you

LIKE THE BANJO? One of the finest records of instruction in this instrument is the 10-inch LP by Pete Seeger that's issued under the Folkways label. $4.25.

DO THEY LAUGH when you get up to cha cha cha? You'll have the laugh on them after a few sessions with Fiesta's LP on this dance. $3.98.

won't be tabbed a "sitzboomer" your first day on the slopes. While the musical background to Miss Werner's narration might better suit a fashion show, the clarity of the instructions on the technique of skiing makes for easy visualization of such basic elements as kickturns, snowplows, schuss position, etc.

As with all learning, it takes a certain amount of effort on the part of the student to master any subject. Let's face it —you have to practice with every disc you place on the turntable. For example, there are many recordings that can teach you International Morse Code, but unless you commit yourself to orderly, daily practice you'll never pass the Federal Communication Commission's 13-words-per-minute test for the General Class license.

One of the best recorded code courses on the market [*Continued on page* 172]

HOW TO SKI, a 12-inch LP (Skico) narrated by ski champion Gladys Werner, instructs beginners in the basic elements of skiing. $3.95.

LET AIR DO THE WORK

PLENUM CHAMBER in floor allows heavy load on pallet to be easily pushed around a corner.

BAND SAW bed equipped with Glide-Aire permits metal slab to be guided into blade.

A NEW cargo handling system is "floating" baggage into airliners, moving heavy machinery with ease and making it possible for massive metal stock to be guided on a band saw bed with finger-tip control.

The system is called Glide-Aire and was developed by the Douglas Aircraft Co. There are two Glide-Aire methods. One is the air-in-floor system which consists of a compartmented floor fitted with a chamber of air under pressure—called an air plenum chamber. The floor has spaced ball air valves which protrude slightly above the surface.

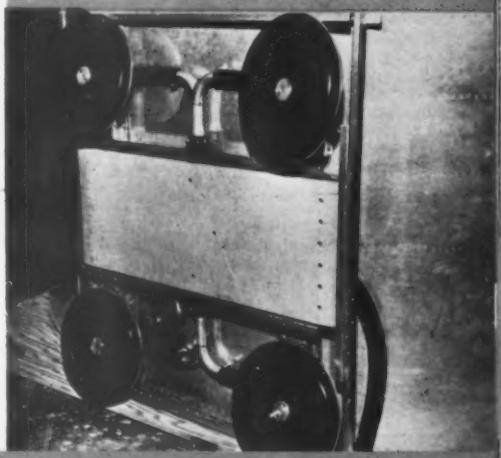
As a heavy load is pushed over the

floor (with no more effort than it takes to push a supermarket cart) the ball valves are depressed, allowing air to escape and providing a thin cushion of air on which the load "floats." As the load passes, the individual ball valves are closed by spring loading, shutting off the air where it isn't needed.

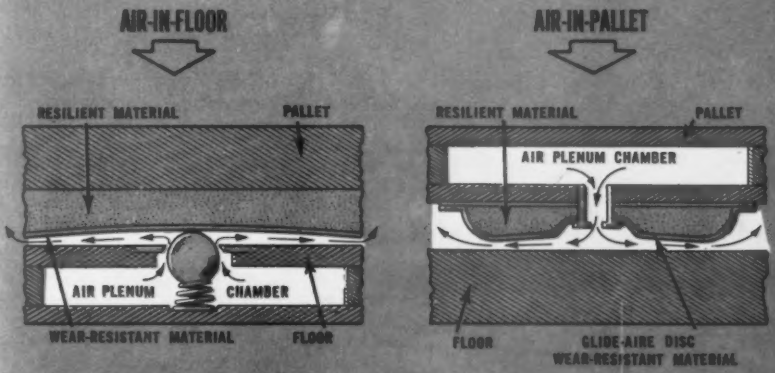
The second system is the air-in-pallet method. This uses a cargo-handling pallet with an air plenum chamber built into it. Air is supplied from a shop line or mobile air supply. The pallet is equipped with resilient discs on the bottom, through the center of which the air is forced out. When the load is in position, all air is shut off and the load braked into place. The pallets can be attached to baggage containers or any other cargo pods.

Applications of the Glide-Aire system are practically limitless. It has been tested on everything from moving freight on a truck bed to positioning airliners for weighing. Loads from 100 lbs. to seven tons have been moved on cushions of air of one to 35 lbs. per square inch pressures. In the foreseeable future are home and shop applications. A home paint compressor, for example, can supply sufficient air pressure to "float" anything in a home workshop. Why use muscle when you can let air do it?—*Gordon B. Ashmead*

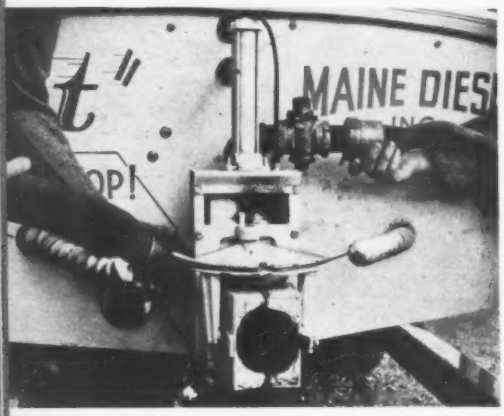
BAGGAGE CONTAINER, weighing 750 lbs., moves on layer of air and can be pushed by one man. Below, container bottom has discs with central air holes.



DIAGRAMS show two Glide-Aire methods developed by Douglas Aircraft Co. Air plenum chambers can be built into floor or pallet to float massive loads on a thin layer of air.



FIRE-FIGHTING JET BOAT



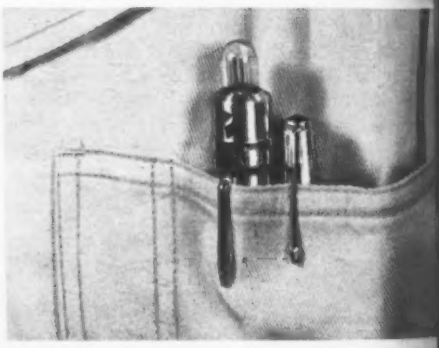
HYDRANTS welded to Turbocraft tailpipe tap the boat's propulsive stream of water.

BIG SQUIRT (693 gallons per minute) can be delivered while Turbocraft is moving.

TURBOCRAFT, the Indiana Gear Works boat that is driven by water jet propulsion, was featured in the May '60 MI as a fast, maneuverable boat that operates marvelously in shallow water. Now, Jack Dowling and John Gannah of Maine Diesel, Augusta, Me., have turned a Turbocraft into a fire-fighting unit. Their boat can get a working stream of water to remote lakeshore locations long before conventional fire department rigs can make the scene. •

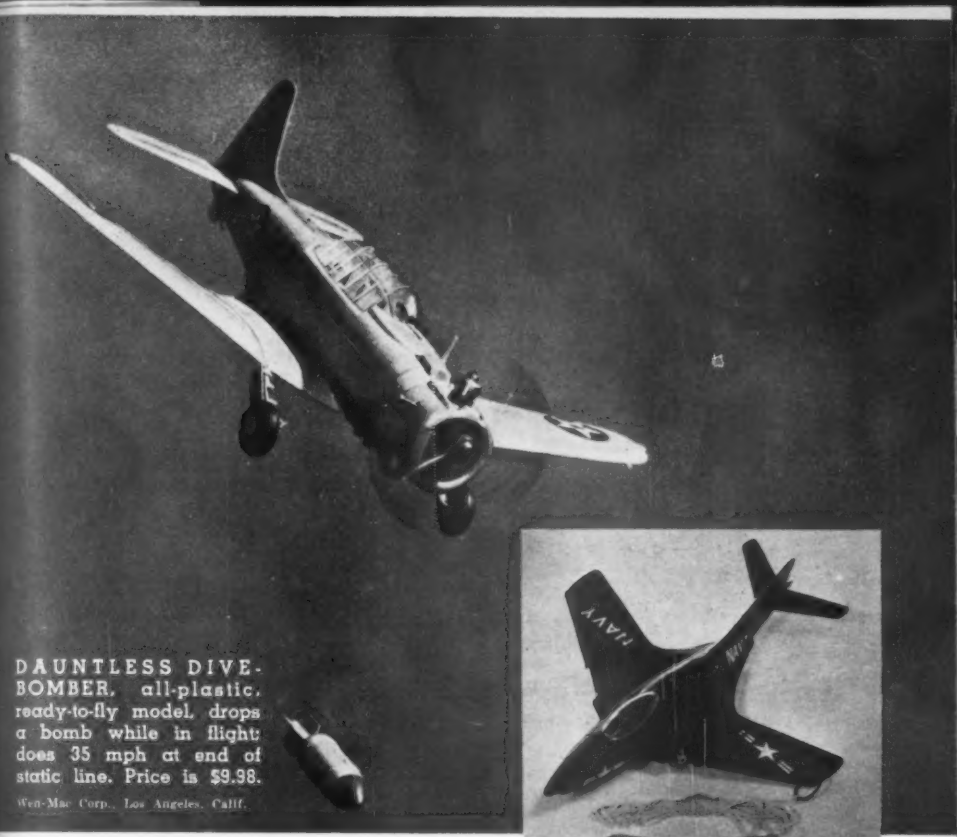
PEN-SIZE RADIATION ALARM

SWITCHLESS device works 24 hours a day for a month on one small mercury battery.



POCKET DETECTOR gives twin warnings—the tone sounds and the neon lamp flashes.

PEOPLE working around radioactive stuff will soon have a breast-pocket detector called PRM—Personal Radiation Monitor. Developed at Oak Ridge Lab, Tenn., it uses a tiny Geiger counter, a hearing aid earphone, a neon lamp, three transistors, five diodes—all powered by one miniature mercury battery. •



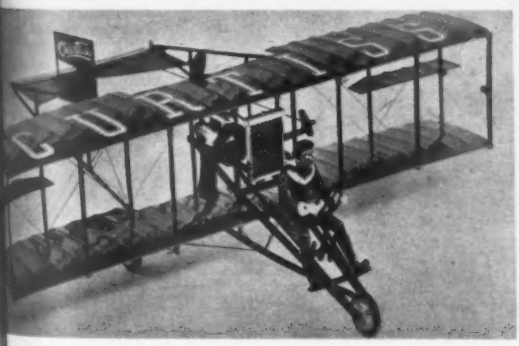
DAUNTLESS DIVE-BOMBER, all-plastic, ready-to-fly model, drops a bomb while in flight; does 35 mph at end of static line. Price is $9.98.

Wen-Mac Corp., Los Angeles, Calif.

NEWEST MODEL PLANES

F9F-8 Jet Fighter flies and stunts at end of a hand-twirled line. It's one of six whip-flying fighter plane kits available at hobby shops at 98 cents each.

Revell, Inc., Venice, Calif.



CURTISS PUSHER, famous old-time flying machine, has been revived in miniature. A respect for minute detail has contributed remarkable realism to this engine-powered classic. $10.

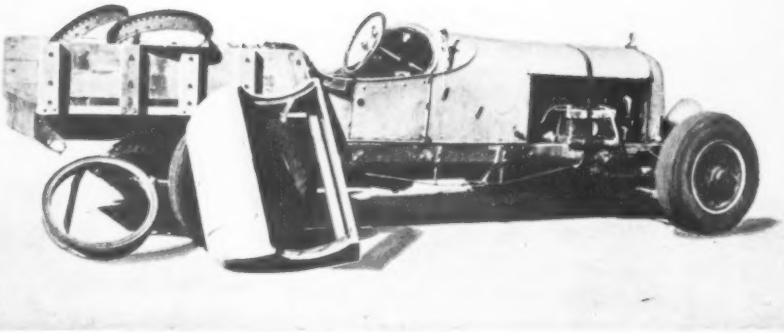
L. M. Cox Mfg. Co., Inc., Santa Ana, Calif.

L 20 BEAVER, USAF utility plane has 21-inch wingspan, is 14½ inches long. Of laminated plastic and balsa, it is powered by a rubber band. $1.49.

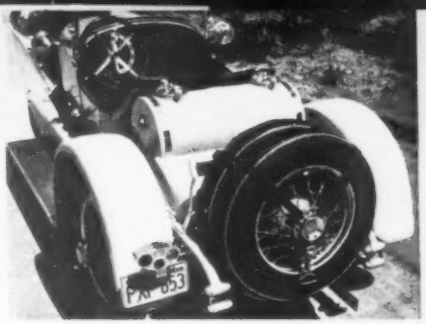
Monogram Models, Inc., Chicago, Ill.

BUSTER KEATON'S MERCER RACEABOUT

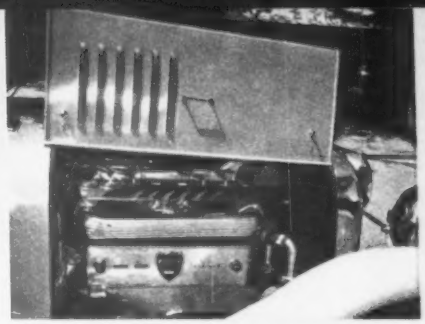
ZANY deadpan comic Buster Keaton tooled the streets of Hollywood in the Roaring 20s at the wheel of this 1921 Mercer Raceabout. It was the fastest and raciest car of its day—and one of the most exclusive. Mercer of Trenton, N. J. produced the two-seater which sold new for $5,000. Its 298-cubic-inch mill produced 75 hp; the car weighed 3,200 pounds. A four-speed gearbox contributed to its terrific acceleration but it couldn't travel at its top 80-mph speed because of the dirt roads of the time. Keaton traded this auto in 1926. Then, in 1949, a dilapidated pick-up truck was discovered by car collector Elliott Wiener, a friend of Keaton's. Wiener found it was the original Keaton car when he checked the serial number. All the original parts had been carefully stored away. Wiener restored the Mercer to its original condition and Buster had his old car back.—*Griffith Borgeson*



ANCIENT pick-up was discovered by car collector Elliott Wiener in a Los Angeles, Calif. suburb. When Wiener checked the serial number he discovered that it was his friend Keaton's original Mercer racer.



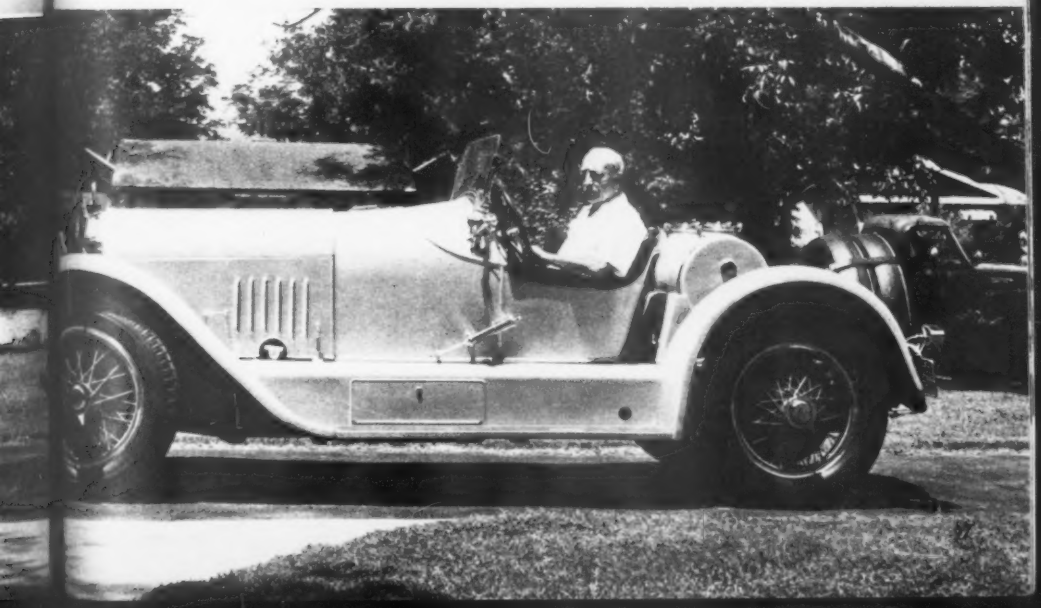
LUCKILY, racer's parts had all been put away. Wiener restored car to its original condition. Note the flashy dual spares.

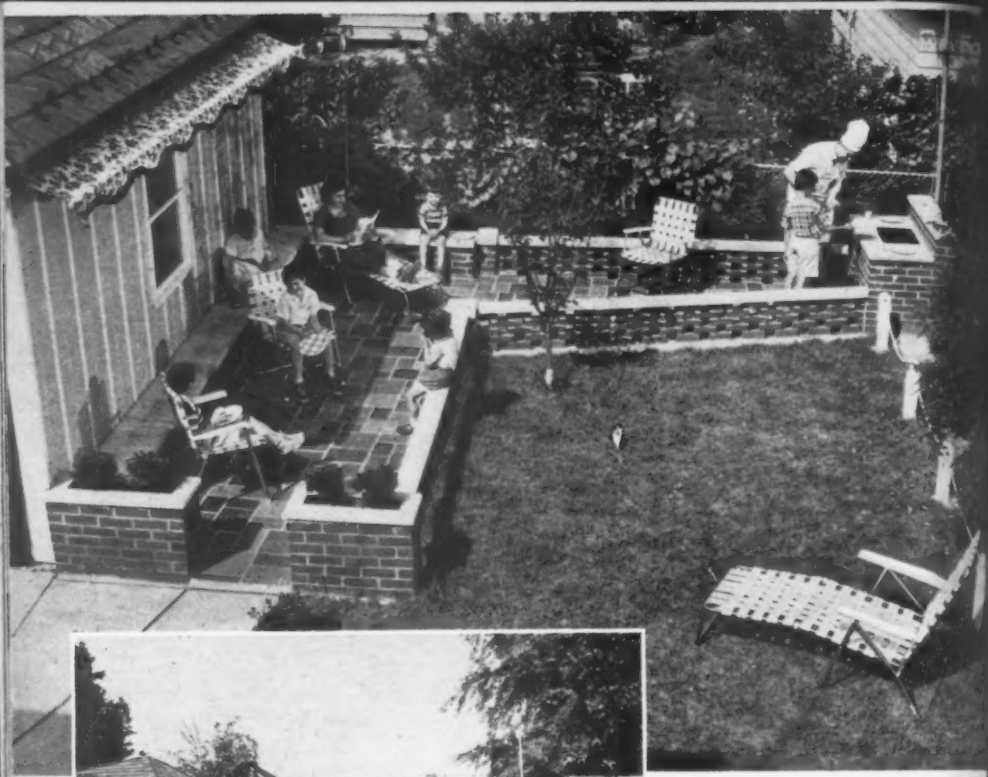


HEAVY engine is a 298-cu. in. rig putting out 75 hp. The car can do 80 mph on modern roads; it couldn't on old dirt ones.

TWO-SEAT Mercer Raceabout has four-speed gearbox which gives car terrific acceleration. The seats are genuine leather.

DASH is elegant, simple, above. The floor-mounted shift is next to hand brake. Comic Buster Keaton (below) in jazz-age classic.





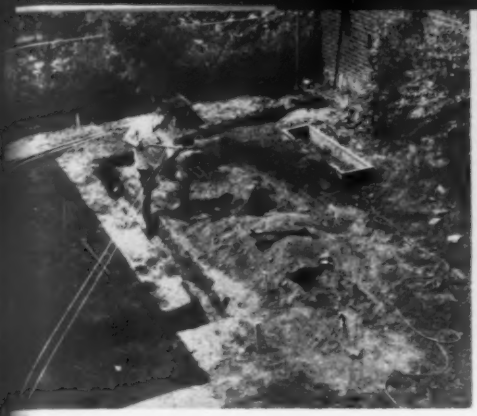
A HANDSOME PATIO (above) is the final result of a transformation which began with a neglected back yard (left). Made with a little money and some healthy hard work the patio and its built-in barbecue become the center of home when the hot weather comes.

LIVE IT UP...OUTDOORS

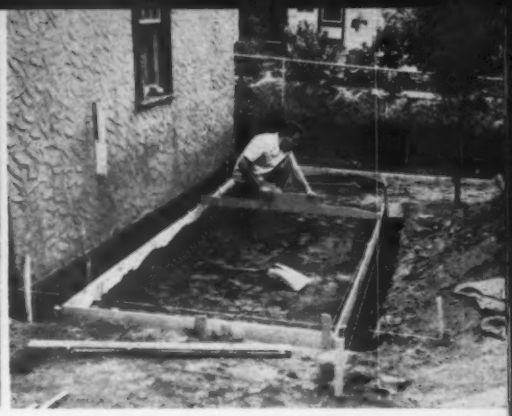
By R. J. Capotosto

THE era of outdoor living has arrived. From the first buds of spring continuing on through to the threat of the first snowfall, Americans are moving their dining and living rooms to the back yard. It's an ideal arrangement. By building a suitable patio outdoors you provide benefits for every member of your family. Better appetites, healthful relaxation and, above all, a picnic area you can get to without the frustrating bumper-to-bumper journey almost unavoidable on today's highways.

If you have the space, no matter how big or small, the addition of a patio will improve the esthetic as well as the



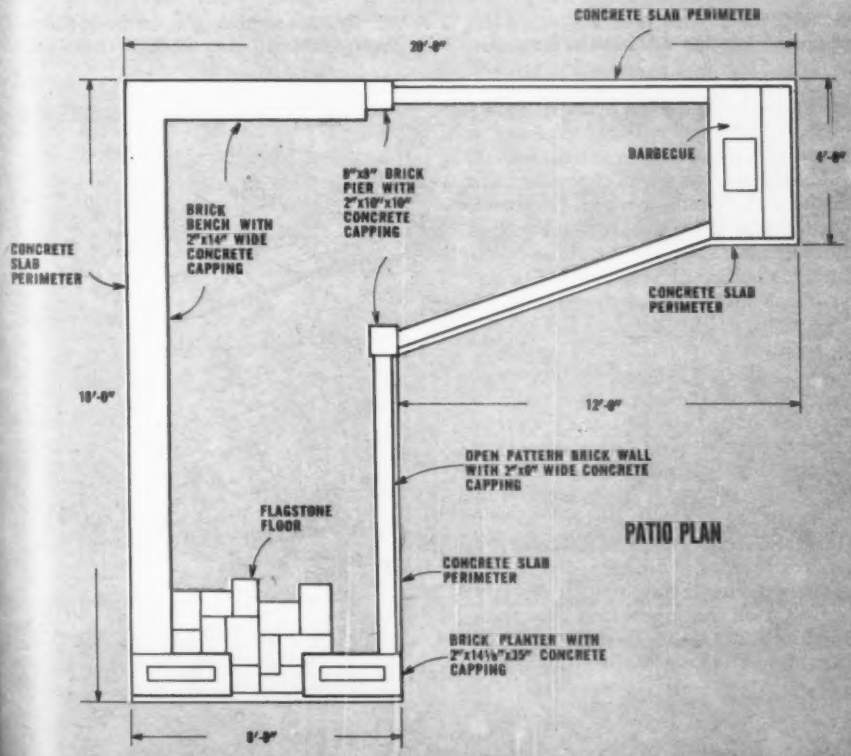
EARTH is removed from staked out area. Slab needs 10-inch depth, footings 18 inches.



STRAIGHTEDGE is used for checking depth. Inside form will contain the cinder base.

monetary value of the property. To do a job like this two things are required; muscle and some money. Of course, if you can afford it you may want to avoid the elbow grease and hire a contractor; but bear in mind that a large part of the enjoyment of a patio like this is the thought that you have created it with your own hands. If you are inclined to shrug off the idea of such a project because you "never did masonry work," don't underestimate yourself. The job illustrated was done by an ordinary homeowner with absolutely no previous masonry experience.

Features of this patio are a built-in



PATIO PLAN

CINDER layers are spread, wetted down and tamped with old cement filled bucket.

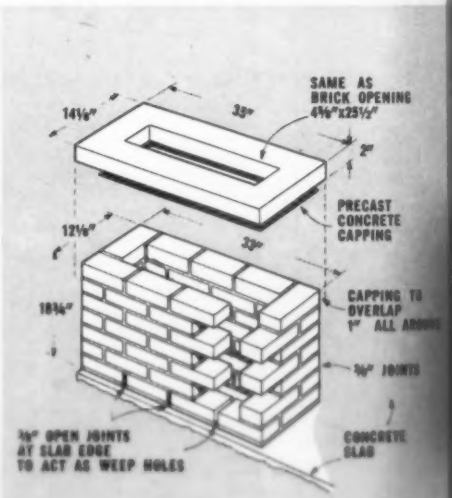
RENTED concrete mixer and contractor's barrow are well worth the cost of hiring.

CONCRETING is a two-man job, one pours and tamps while the other feeds the mixer.

WIRE MESH reinforcing must be jockeyed to lie two inches below surface of the slab.

bench 24 feet long and an attractive flagstone floor bordered with an ornamental brick wall which leads to the all important fireplace. A curved concrete path from the house leads through two brick planters which form the entrance to this truly charming spot.

Built for lasting strength, the foundation consists of a five-inch bed of cinders with a footing for the wall 18 inches deep around the perimeter. This excavation and the pouring of the concrete were the heaviest work. If the area had been accessible to a ready-mix concrete truck this would have been the preferred method of pouring. However, since such a heavy vehicle could not safely cross the curb, an electric mixer was rented from the mason supply house, which made it possible to complete the pouring between sun-up and sun-down. For this operation two men were essential, one to feed the mixer, the other to run the wheelbarrow. Such

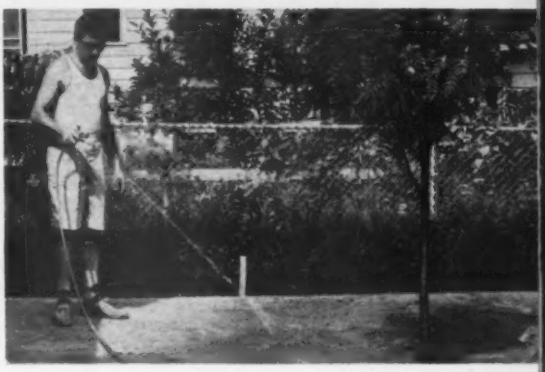


PATIO PLANTER DETAIL

SURFACE is levelled off to forms at the side with zig-zag motion of straightedge.

ROUGHENING of surface by stiff broom provides "tooth" for cementing flagstones.

OUTSIDE EDGE which will remain exposed is rounded and compacted by edging tool.



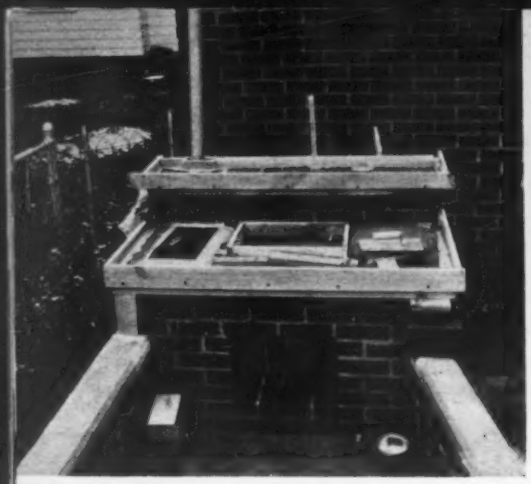
CURING of concrete is most important. Should be kept wet for at least ten days.

a job cannot be too well done with a garden wheelbarrow. For a dollar we rented a contractor's barrow which was both large and sturdy enough for the job.

The first step in the project is to mark out the limits of the slab with stakes and string. Dig out the earth ten inches deep and to an 18-inch depth where the footings will be. It is important to shovel out all loose earth so the foundation will rest on solid ground. The top surface of

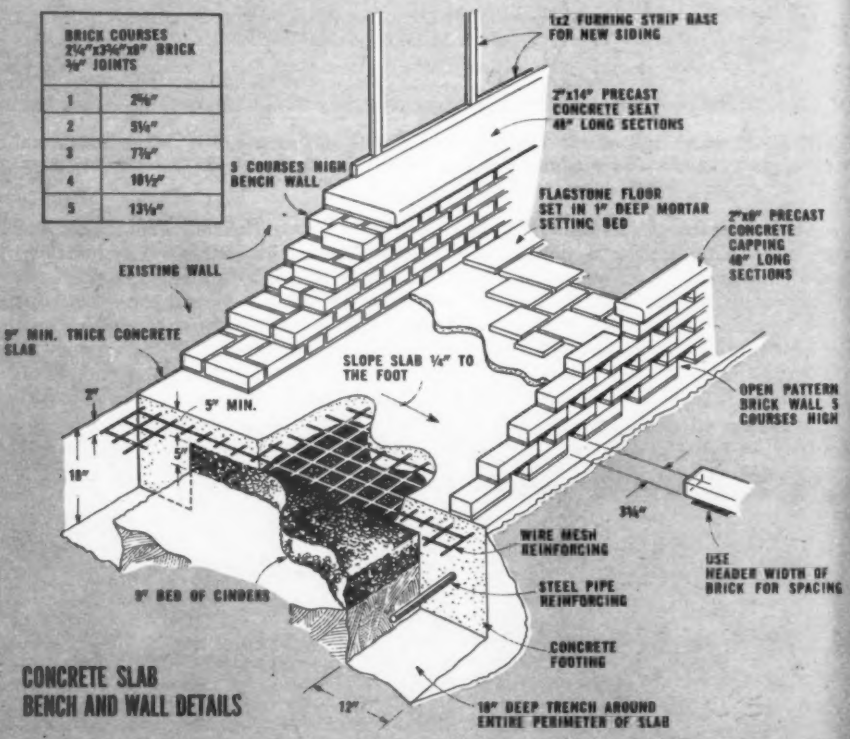
BASE AREA with concrete work completed means that heavy work of project is over.

BRICKS must be dampened before laying. Use "stiff" mortar, mixed in small quantities.



FORMS are built around completed barbecue brickwork for casting tops in place.

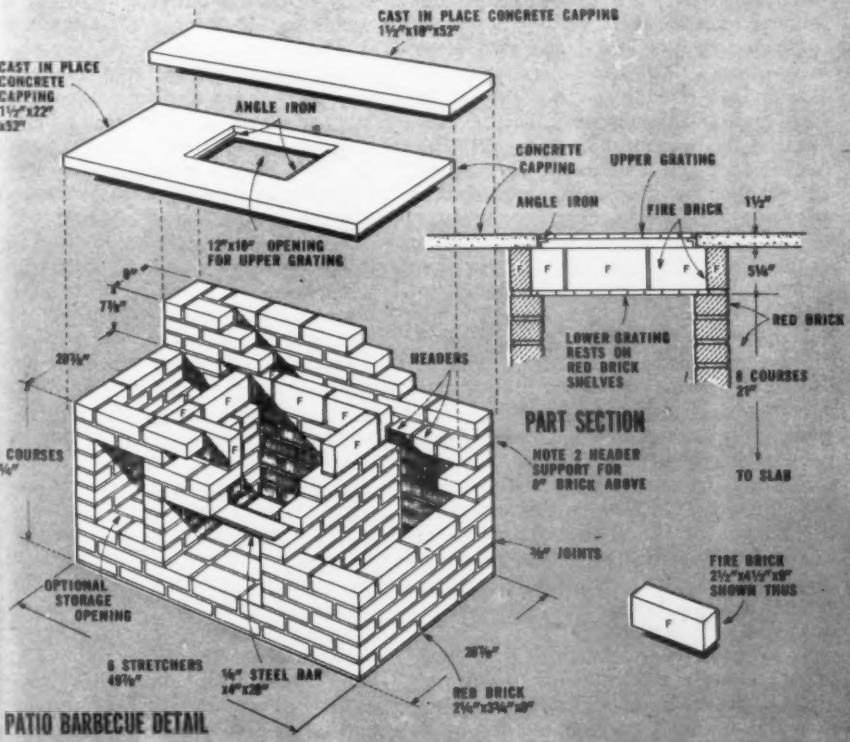
PRE-CAST bench tops, wall cappings, are concrete reinforced with hardware cloth.



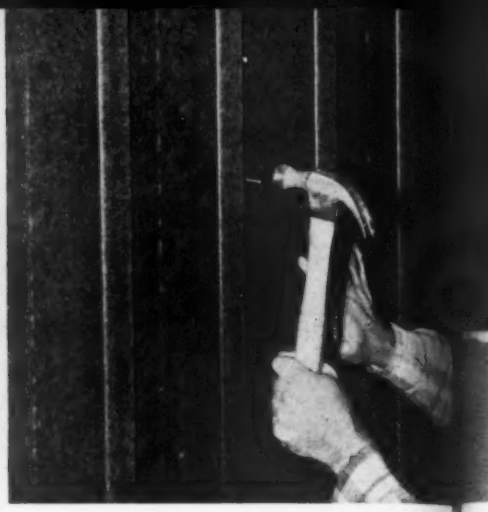
CONCRETE SLAB BENCH AND WALL DETAILS

HEAVY SLABS are laid with "dry" mortar mix as weight would squeeze out wet one.

ROUGH stucco wall is furred with strips to provide a nailing surface for the siding.



PANELS four feet wide, cut to size by a saber saw are positioned on wall of the garage.



TOUGHNESS of panels necessitates drilling before securing with aluminum nails.

the slab is established with a taut line level. To drain off water, a two-inch pitch from rear to front is necessary, one quarter-inch for each foot.

Guided by the line, stake the forms in position. The forms consist of an inside and an outside section. The inside form contains the cinder base and prevents it from crumbling away into the deeper footings. This inside form must be removed before the five-inch slab is poured. The outside form must be put up with care as it forms the outside edge of the slab and will be visible.

One-by-six-inch boards are nailed to stakes driven firmly into the ground. The boards are set two inches higher at the rear so as to provide for drainage. The cinder is then spread in thin layers, each layer is hosed with water and then thoroughly tamped down. This is an important phase of the job as this base absorbs and drains off water, to prevent freezing, which would cause damage at the bottom of the concrete. Cinder is added until it is flush with the top of the inside forms. It is considered well-tamped when you can walk on it without leaving footprints.

To prepare for the pouring of the concrete make a ramp to bridge the forms, arrange for a handy supply of water near the mixer (a garbage can fed by a hose will do) and have your cement stacked in a dry place nearby. The usual procedure is to mix half a bag of Portland cement to seven shovels of gravel mix. Add sufficient water to make a mix which can be poured. Too much water makes weak concrete. As the wetness of the sand is a variable factor, there can be no hard and fast rule as to the amount of water to be used so stick by the rough rule—just wet enough to flow or pour. Make a trial batch keeping track of the amount of water used. Once started, keep the stuff pouring.

Pieces of old pipe may be used for reinforcing the footing. Lay the pipe in when the trench is about half-filled with concrete. The slab itself is reinforced with heavy wire mesh. The wire should lie near the surface of the concrete, so keep it raised to the proper height as you go along. A rake and a hoe are good tools for tamping and working-in the concrete.

The freshly placed concrete is leveled off flush with the top of the forms by working a straight-edged board across the surface with a saw-like motion. Before the concrete hardens it should be brushed with a stiff broom, leaving a roughened texture as tooth for the flagstones and brickwork to follow. At the outer edges of the slab, where the concrete will remain exposed, an edging tool is used to round off and compact the edges.

Very important for successful con-

SABER SAW cuts panels easily. To get a smooth finish cut from back of the panel.

EACH FLAG must be tapped firmly for a good bond; are sold in pre-cut packages.

crete is the curing operation. For about ten days the slab must be kept continuously wet. We started out with frequent hosings but found this too time-consuming. The problem was solved by covering the entire slab with a layer of earth several inches thick which was thoroughly wetted down once a day.

At this point, while the curing process was going on, we began work on the garage apron and curved path to the patio. The old concrete was broken up and forms were constructed in long three-foot sections. Concrete was poured in alternate sections. Two days later, when these had hardened, the wood forms were removed and the remaining sections filled in.

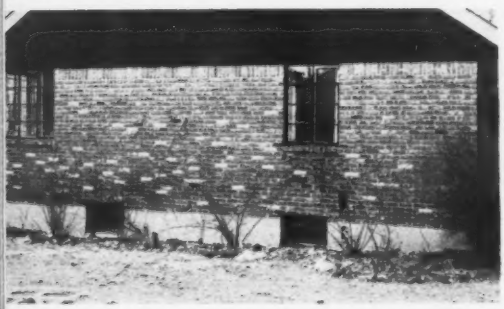
Practice sessions gave us the confidence needed [*Continued on page* 138]

EXCESS cement is removed with muriatic acid (wear rubber gloves) and wire brush.

BLENDING of colored tiles and bricks can only be appreciated in color photograph.

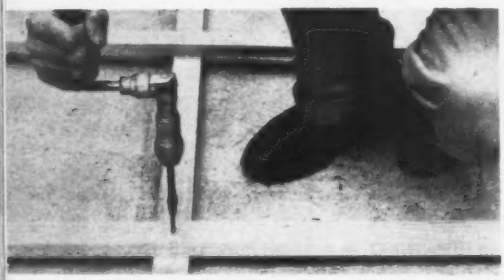
GARDEN TRELLIS

PLANTS AND VINES, unlike people, keep on growing bigger all the time. So, train them early in life and show them how to live a comfortable life supported by a trellis!



BARREN SIDE of house photographed early spring. Compare to above, taken late June.

TRELLIS (1x2-inch stock) should be two feet smaller than wall surface it is to cover.



THE SQUARES are laid out on 12-inch centers. Drill pilot holes; use brass screws.

A WEATHER-RESISTANT, two-solution white paint, Poly Form, seals it from weather.

FIRST STEP in mounting. Tie back all vines to stakes so as to get working clearance.

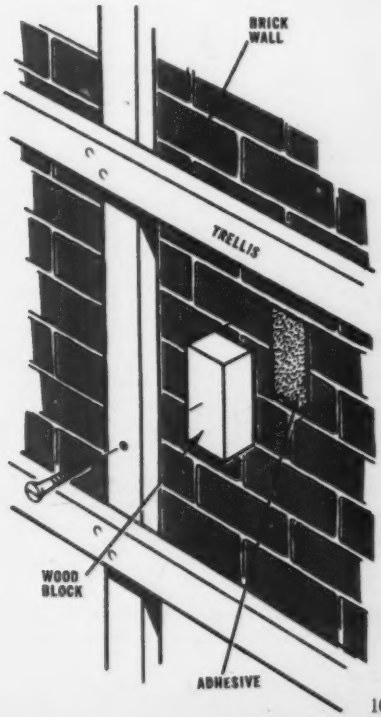
NEXT STEP, coat a dozen blocks of wood (2x3-inch stock) liberally with Tuff-Bond.

SET THE TRELLIS temporarily into position and chalk-mark the area behind uprights.

CEMENT BLOCKS to wall so that each block will be exactly behind a trellis section.

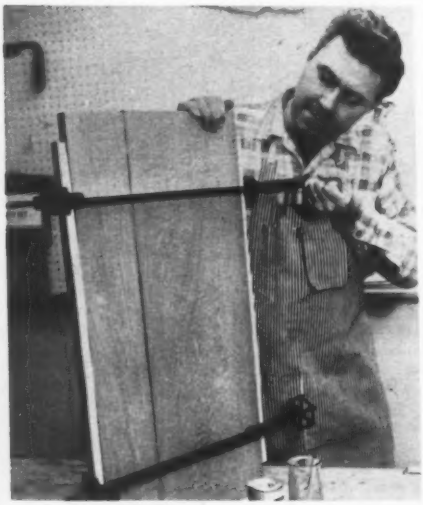
GIVE THE ENTIRE wall a thorough spraying with a silicone to make it water repellant.

AFTER CEMENT HAS DRIED (about two weeks) fasten trellis with brass screws.



COMPOST BOX

NEAT-LOOKING redwood box withstands the decay-producing bacteria in a compost heap.



BOARDS which form sides are edge-glued and clamped. The glue must be waterproof.

Why buy fertilizer when you can make it in your own back yard—for free!

ORGANIC waste from your garden and kitchen, when heaped in an enclosure and allowed to decay, will produce a rich humus which is nature's own best fertilizer for plants and vegetables.

The enclosure is simply a box without a bottom and an excellent one can be built of redwood, a wood that withstands the effects of weather, termite attacks and the busy little decay-producing bacteria that raise the temperature in a compost heap to 140° or more. The Simpson Redwood Co., Arcata, Calif., recommends a heartwood grade of redwood and will supply a brochure, Redwood For The Home And Garden,

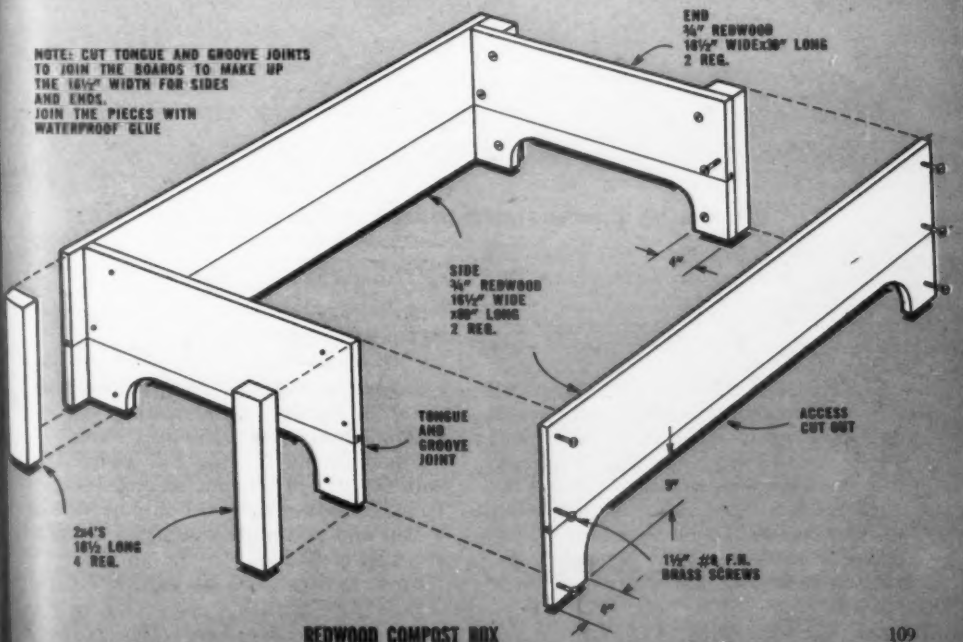
BRASS rather than steel screws are preferred because they will not rust through.

SPECIAL FINISH filters out sun's ultraviolet rays which tend to darken redwood.

to readers of MECHANIX ILLUSTRATED.

The box illustrated has ample capacity for the average garden, yet is small enough to blend inconspicuously with any setting. The 16½-inch width of the sides is made up by cutting tongue-and-groove joints along the edges of readily-available narrow boards and joining them with waterproof glue. Assembly is then completed with brass screws at the corners.

Although redwood has natural durability and needs no preservative, the ultraviolet rays of the sun will darken it. If it is desired to keep the original coloring, Breicraft Stain and Durable Woods Exterior Finish are a combination that will filter out these rays. •



REDWOOD COMPOST BOX

ELECTRIFIED LAWN MOWER

POWER DRIVEN BLADES of ex-hand mower cut whether it is pushed, pulled or standing.

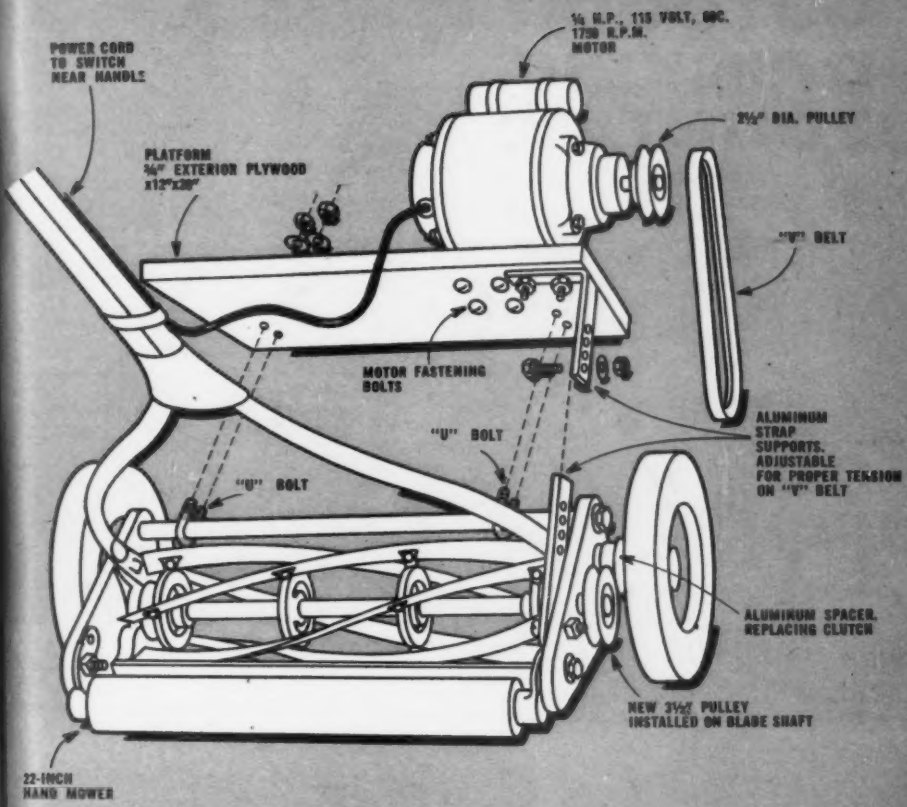
Ingenuity and a spare motor convert a hand mower to power for less than three dollars.

By Vincent Guido

ALTHOUGH the sight and sound of a man mowing his lawn by hand had become almost a thing of the past, I had continued to push a sturdily-built lawn mower of traditional design around my garden. It cut the grass adequately but at the expense of a lot of energy. I decided to modernize but instead of investing in a new power-driven mower I thought an equally effective machine could be produced by making use of equipment already in my possession.

I had in my basement a ¼-hp 115 volt, 60 cycle, 1750 rpm. electric motor. To make the conversion I only needed a V-belt and two pulleys which I bought at a cost of $2.90.

First, to serve as a platform for sup-



ELECTRIC MOWER CONVERSION

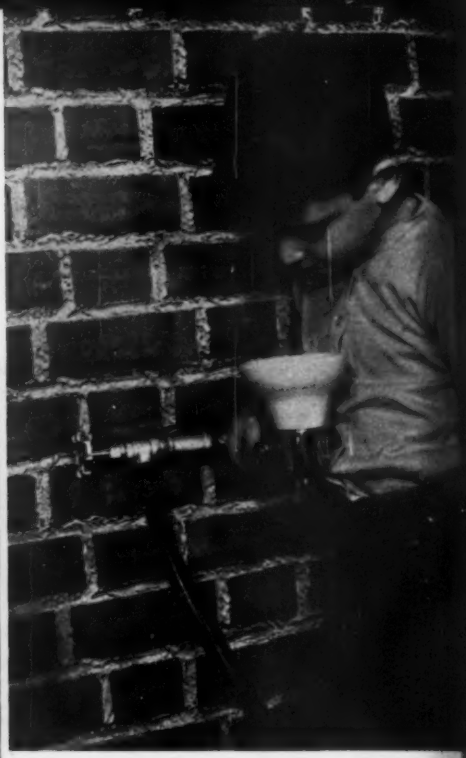
porting the motor I cut a piece of exterior plywood to the required size, 20x12 inches. This was attached to the top cross bar by two U-bolts. One end of an aluminum strap was then screwed to the bottom of the platform at the driving side, and the other end bolted at the slot in the frame where adjustments are normally made. This strap allows the platform to be moved so as to increase or slacken the tension of the V-belt. The motor was then bolted to the platform with four quarter-inch bolts.

The next step was to remove the small cog or pinion [*Continued on page* 162]

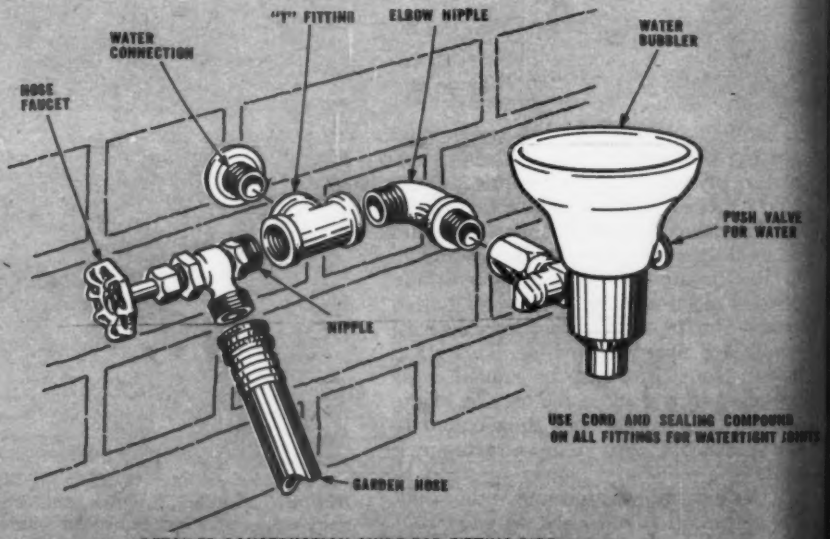
ALUMINUM SPACER which replaced pinion gear is seen below pulley of blade shaft.

OUTDOOR DRINKING FOUNTAIN

FIRST turn off water, remove the existing faucet and then follow assembly shown below.



OUTLET supplies hose and drinking fountain. Porcelain "bubbler" costs less than five dollars at large plumbing supply houses.



DETAILED CONSTRUCTION GUIDE FOR FITTING PIPE

tips for tacking

WITH YOUR *Swingline*

automatic staple gun

Before you buy another pot of glue, nails or tacks, check this handy do-it-yourself booklet and learn how to save time, money and effort with a Swingline Automatic Staple Gun.

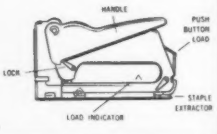
STAPLING HAS COME OF AGE! *In this special report you'll see why countless thousands are taking to automatic gun-stapling as a new basic tool for quick, low-cost, care-and-repair projects around the house, farm, garden, workshop, auto, crafts, hobbies.*

This booklet shows you
what can be done easily and quickly with a **Swingline** Staple Gun.

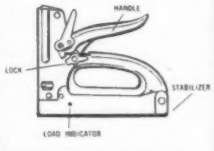
(a) Upholstering, (b) Recovering card table and chairs, (c) Installing carpeting, (d) Insulating, (e) Valances, (f) Hanging drapes, (g) Installing plastic wall brick, (h) Weather stripping

SPECIAL FEATURES:

#101



#900



FACTS ABOUT SWINGLINE STAPLE GUNS

No. 101 Staple Gun — Retail $4.95
Staple sizes — 4/16" and 5/16" leg length
Cost per box — 59¢ per 1000

No. 900 Staple Gun — Retail $12.50

Staple sizes -	3/16"	4/16"	5/16"	3/8"	1/2"	9/16"
Cost per box of 1000	55¢	55¢	60¢	60¢	70¢	75¢

HOW TO USE A TACKER CORRECTLY

For solid driving — hold your tacker flat and snugly against the work you are stapling.

Extra deep penetration — press the thumb of the hand which is not holding the gun on the extreme top portion as shown.

THE *Swingline* automatic staple gun ...your most versatile hand tool

Whatever your tacking problem, Swingline has an automatic staple gun to solve it. The Swingline No. 101 is more than adequate for most projects in and around the house, and handles the most frequently used staple sizes, 3/16", 1/4" and 5/16". The heavy-duty No. 900 is slightly larger, and can handle seven sizes of staples ranging from 3/16" to 9/16", and may be rented at hardware stores and building material suppliers. The model you choose will depend upon the uses to which you will put it, and the staple sizes you require.

In either case, you'll find your Swingline Automatic Staple Gun a model of simplicity in operation. You load it as easily as dropping coins in a slot, hold it against your "target," and squeeze the trigger. The staple is rammed home with the spring-drive punch of a 200-lb. pile driver. It's that easy, quick and foolproof.

And your Swingline Automatic Staple Gun will last a long, long time. The Swingline No. 101, for example, has a proven longevity of about 250,000 "shots" or an estimated 60 years of average home and workshop use. But don't fire your staple gun when it is empty. It can shorten its life span.

Don't be afraid to experiment with your Swingline Automatic Staple Gun, either. At a price of only 59¢ to 75¢ per box of 1,000 staples, it will cost you only a few pennies to discover some ingenious time-saving, money-saving, work-saving, fun-making use for the gun.

Now, to start you thinking, turn the pages for a good look at some of the proven ideas that have been compiled by Swingline Automatic Staple Gun users.

YOUR *Swingline* STAPLE GUN AT HOME

FIG. 1

FIG. 2

The Attic, Crawlspace, Unfinished Rooms

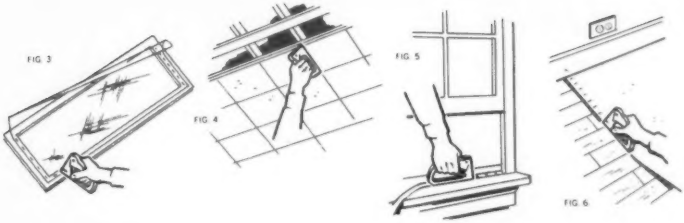
INSULATING MADE QUICK AND EASY WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16" LEG STAPLES. Insulating with a staple gun is simple because you can hold the insulation with one hand while you staple with the other. You don't need "three" hands, a helper, or a mouthful of nails. If you can place the stapler against the wall and squeeze, you can insulate. **TIP:** When installing insulation, start from the top and work down. *(Fig. 1)*

The Living Room, Kitchen, Playroom or Den

UPHOLSTERING FOR FUN AND PROFIT WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16" OR 3/8" LEG STAPLES. That old easy chair or couch can be recovered in a jiffy with a staple gun. Almost all upholstered furniture is built around a wood frame. The rest is webbing, springs, stuffing and covering. Strip away the old covering, even the webbing; then recover or reweb simply by stapling new materials to the frame. **TIP:** In stretching materials to fit, shoot the Model 101 staple at about a 45° angle to your pull. In other words, if you're pulling material straight down, hold your gun diagonally to the line of pull. *(Fig. 2)*

MAKE CARD TABLES AND BRIDGE CHAIRS NEW AGAIN WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16" STAPLES. You can recover the tops and seats in no time at all with an automatic staple gun. Cut new materials to fit the table tops or seats, allowing two or three inches of material to overlap the sides. Place material, face down, on

YOUR *Swingline* STAPLE GUN IN THE HOUSE



floor or workbench. Center tops or seats on the material, fold in overlap, and staple down.

YOU CAN HAVE SCREEN DOORS IN MINUTES WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16″ OR 3/8″ LEG STAPLES. Place your door frame on a table or flat working surface. Chock the door up about six inches. Place two clamps across the short side, toward the center, and tighten clamps slightly until door begins to "bow." Now staple wire screening to the door frame, stapling the short ends first. Then remove clamps and staple along the sides. Your screen door will be as taut and neat as a factory job. *(Fig. 3)*

HOW TO KEEP WALLPAPER LOOKING NEAT WITH THE SWINGLINE NO. 101 STAPLE GUN USING 4/16″ STAPLE LEGS. A common problem with wall-papered rooms, especially basement playrooms, is peeling around window and door edges. Hold the peeling wallpaper in place by shooting staples along the edges. They will scarcely show.

INSTALLING CEILING TILE WITH THE SWINGLINE NO. 900 STAPLE GUN USING 9/16″ LEG STAPLES. No need to be a juggler when installing ceiling tiles – if you have a staple gun. Forget the nails or brads. Simply place tile in position with one hand and use the Swingline No. 900 to shoot in staples with the other. *(Fig. 4)*

General Utility and Tender Loving Care with Swingline Staple Guns

HOW TO INSTALL OR KEEP WIRING SYSTEMS IN PLACE WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16″ OR 3/8″ LEG STAPLES. Got a doorbell, buzzer, inter-com, or fire-alarm system around the house? Slack wires anywhere? Use your staple gun to install or keep your low-voltage wiring systems neatly and permanently in place. If you don't like "naked" metal against electric wires, here's a **TIP:** Just cut little strips of electrician's tape and press each strip around the wire at regular intervals. Then shoot staples over the taped areas.

HOW TO SAVE ON HEATING BILLS WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16″ OR 3/8″ LEG STAPLES. With your staple gun and any weather stripping that would otherwise take a nail or tack, you can do a top-notch and low-cost job of weather-stripping the entire house. But don't overlook the asbestos or other heat-insulating shielding around the piping system. If you find a worn or damaged asbestos covering, for instance, just gun-staple or patch over it. *(Fig. 5)*

HOW TO INSTALL FLOOR FELTING WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16″ LEG STAPLES. Forget about the old-fashioned adhesives. Staple felting to the floor, wherever you intend to lay tiles, linoleum or rugs. The beauty of this time-saving staple-gun trick is that it works two ways: Quick installing, quick removing. After the felt is off, there's no messy adhesive to scrape off. *(Fig. 6)*

HOW TO SAVE WINDOW SHADES WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 1/4″ LEG STAPLES. Don't throw old window shades out. Save the wooden rod that comes with the shade and simply staple new material to it. You can do the same when wooden **VENETIAN BLIND SLATS** come loose from their tapes.

FIG. 7

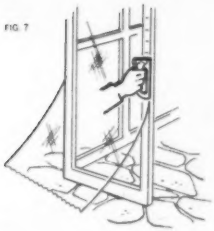


FIG. 8

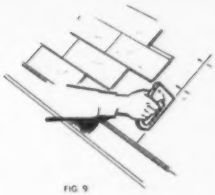
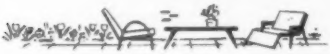


FIG. 9

FIG. 10

HOW TO MAKE "FALSE" WINDOWS WITH A SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16" OR 5/8" LEG STAPLES. Put up molding or valance across the area desired for a simulated window. Now to get that drapery effect: Shoot a staple through the material six inches from the end, then fold back three inches and shoot another staple into the molding or valance. Continue clear across for a perfectly formed drape.



The Patio and Garden

HOW TO CONVERT A PATIO WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16" OR 3/8" LEG STAPLES. Set 2' x 4' framing around the patio. Then tack wire screening around with your staple gun. It's that easy to make yourself an outside screened-in porch or room. Make a temporary windproof winter play area by stapling clear plastic over screening. *(Fig. 7)*

MAKING GARDENING EASIER WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 4/16" LEG STAPLES. Next time you want to label your flowers and vegetables, staple labels to wooden stakes and install. *(Fig. 8)*

For Roofing and Siding

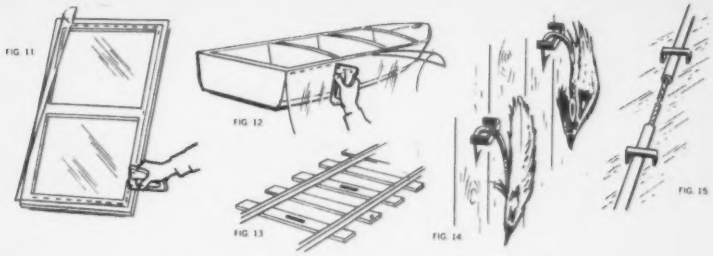
FELTING AND TAR-PAPERING MADE EASY WITH THE SWINGLINE NO. 900 STAPLE GUN USING 1/2" LEG STAPLES. If you're putting up new siding or roofing shingles, the quickest way to tar paper between the sheathing and siding, and to lay 15-lb. roofing felt, is to fire away with your staple gun. **TIP:** When installing tar paper, staple the outside edges at about every eight inches for a tighter, weatherproof fit. Away from the edges, staple every twelve inches. *(Fig. 9)*

TIPS THAT HELP AROUND THE FARM WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16" LEG STAPLES. (1) If you're going to **WHITEWASH THE BARN** or shed, staple old burlap bags around the windows and paint or spray freely; (2) If **TRASH BARRELS** are loaded, or you want something extra to hold grass cuttings, staple wrapping paper inside your surplus wooden crates or wire baskets; (3) *(Fig. 10)* Repair damaged **VEGETABLE BASKETS.** Use your staple gun to patch holes and cracks in them; (4) Staple clear plastic around old baskets to make **MINIATURE GREENHOUSES** or to **PROTECT PLANTS** against frost; (5) **POST SIGNS** and notices to trees in a jiffy. If you use your trees for lumber, you'll find that the staples won't ruin the trees; (6) Repair canvas on **COMBINES AND SWATHERS** by gun-stapling canvas to the slats; (7) Stretch **ANIMAL SKINS AND FURS** on frames by stapling; (8) Staple plastic sheets **INSIDE THE GREENHOUSE,** all around the glass, to insulate by creating a layer of "dead air," nature's own best insulation; (9) Staple **ALUMINUM FOIL SHEETS** under your heat pipes to reflect more heat.

For Outside Windows and Doors

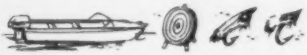
HOW TO PUT UP PLASTIC STORMS WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16" OR 3/8" LEG STAPLES. Modern, sturdy transparent plastics, available at your hardware

YOUR *Swingline* STAPLE GUN IN YOUR WORKSHOP, HOBBIES, AND FAMILY FUN



store or building materials supplier, make ideal inexpensive storm windows. Installation is simple with the staple gun. Cut a sheet of plastic several inches larger than your window all around. Then fold plastic over once or twice along each edge and shoot staples into the folded edges along the window as you fit it around the window. Start at the top of the window. Then do the bottom. When you do the sides, tug slightly at the plastic for a smooth, wrinkle-free fit. Put false moulding on for a more finished look. *(Fig. 11)*

HOW TO WINDPROOF DOORS AND SASHES WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16″ LEG STAPLES. Use your staple gun to eliminate drafts from loose-fitting doors and windows. Jam felt or sponge-rubber strips to the outside of upper sashes and the inside of lower sashes, and around doors. Staple to hold wherever necessary. **TIP:** Work your strips into openings so that it's a little tough to raise the window or open the door.



Boating

HOW TO COVER PLEASURE BOATS WITH FIBERGLAS WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16″ LEG STAPLES. If your boat is made of wood, staple fiberglas cloth around the sides and bottom of the boat when it's dry. Stretch the fiberglas cloth as you staple, to remove wrinkles and "crawling." After stapling, spread resin but don't remove the staples. The resin will cover them and make the holes airtight. *(Fig. 12)*

Sport Shooting

GOOD NEWS FOR TARGET SHOOTERS WITH THE SWINGLINE NO. 101 OR 900 STAPLE GUN USING 5/16″ LEG STAPLES. Don't bother making up a lot of targets for your next pistol or rifle meet. Just carry spare targets or centers and staple them over the old or damaged targets. It speeds up the match.

Model Railroading

ADVICE ON TRACKS WITH THE SWINGLINE NO. 101 STAPLE GUN USING 4/16″ LEG STAPLES. If you're going to nail down HO gauge tracks to your fiberboard base, reach for your staple gun, not nails. The staples won't show when you cover your base and ties with gravel. Use also in making scenery. *(Fig. 13)*

Fishing

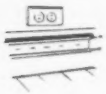
EASY ACCESS TO FLIES AND PLUGS WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING 5/16″ LEG STAPLES. Cut a 1/4″ plywood board to about a 12″ x 12″ square. Shoot 5/16″ staples all around the board. The staple crowns will protrude just enough to hang plugs and flies on them. Then when you've loaded the entire board with your flies and plugs and you stand the board against the side of your boat or tree trunk, you'll see at a glance what you've got. *(Fig. 14)*

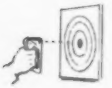
Radio, Hi-Fi and Workshop

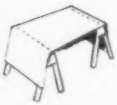
QUICK WAY TO SOLDER WITH THE SWINGLINE NO. 101 OR NO. 900 STAPLE GUN USING PROPER LEG LENGTH. If you do a great deal of soldering on your workbench, you'll find the staple gun can help you in many ways. For instance, lay wire end-to-end on your bench, "collar" each end with a staple and proceed to solder a solid joint.

NEW *Swingline* IDEAS SECTION—WHAT WOULD YOU HAVE DONE?

Now that the gun stapler has become a part of the basic tool kit in countless thousands of homes, new ideas for gun stapling pour daily into the Long Island City (New York) headquarters of Swingline, Inc., world's largest manufacturer of staplers for home and office. Here are just a few samples. Test your own imagination. Would you have thought of the same thing—or better?







SHOE BAGS. Staple them inside and behind closet doors. **PICNIC TABLES.** Shoot staples through paper plates, napkins, paper tablecloths to keep them from flying away. **KITCHEN SHELVES.** Line them in a jiffy with paper, oil cloth, linoleum or fabric. **PARTY DECORATIONS.** Staple crepe paper trimmings to molding and beams. Make large bulletin boards and staple on holiday or birthday greeting cards, surrounded by stapled-on pine cones. **TV ANTENNA.** Staple down under eaves, along wall and floor molding. **RADIO AND HI-FI.** Staple do-it-yourself circuits to the baseboards. Also staple down screw sockets, transformers, terminals. **TARGET PLINKING.** Set up target (paper or tin can) and stand back about 10-15 feet, and fire away—with the staple gun. It's an ideal playroom sport under adult supervision. **COMMUNITY AND CLUB AFFAIRS.** Posting notices around town with the staple gun makes publicity a one-man job. **IN BUSINESS.** Staple your shipping notices, instructions, addresses directly to the crate or carton. **IN THE BARN.** Staple up those calendars, memos, weather bulletins and repair-instruction sheets. **YOUR AUTOMOBILE.** Staple clear plastic sheet over the lower part of the doors where you always get those hard-to-remove scuff marks, which wash off easily from plastic. **UNDER THE AUTO.** Staple padding to an old ironing board. Then roll another old ironing pad to form a head rest, and staple it to the board. Now you've got a comfortable mat for working under your car. **YOUR WORKSHOP.** For assorted small hardware, shoot a staple through a paper cup onto a wood shelf. You get never-spill containers. **PROTECTING MATERIALS OUTSIDE.** Lay wood blocks around materials to be protected, cover with canvas, staple down to wood blocks. **WHEN LINOLEUM EDGES CURL.** Staple down around the edges, then cover staples with quarter-round molding. **CAMPING IN A PICK-UP TRUCK.** Install wood framing and gun-staple plastic sheeting or canvas to framework for a do-it-yourself camping shelter and trailer. **PARADES AND FLOATS.** Staple posters and banners to wood handles and staple crepe paper, bunting and chicken wire to floats. **BACKYARD PLAY TENT.** Stretch a blanket across two wood saw horses and staple to horses. **SKID-PROOFING OUTDOOR STEPS.** When ice makes edges of wood steps slippery, shoot rows of staples into leading edges of steps for temporary, emergency anti-slip treads.

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Tear out this handy
booklet for quick and easy reference.
Next time you have a nailing,
tacking or gluing job,
think of your automatic gun stapler.
These ideas may help you
save time, effort and money.

THE Swingline automatic staple gun

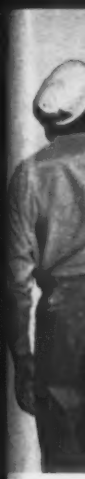
can be the
most important hand tool
in your home, your
workshop or your office.

Here's the checklist for the ideas you'll find inside:

- Insulating around the house
- Upholstering furniture
- Making new card tables
- Making new bridge chairs
- Making screen doors
- Keeping wallpaper neat
- Installing ceiling tile
- Quick wiring installation
- How to save on heating bills
- Installing floor felting
- Save on window shades
- How to make "false" windows
- Quick felting and tar-papering
- Making plastic storm windows, doors
- Windproofing doors and sashes
- Converting patio to outdoor room
- Making gardening easier
- Ten tips that help around the farm
- Fiberglas covers for boats
- Making oil-paint canvases
- Tips for sport shooters
- Tips for model-railroaders
- Tips for fishing aids
- Tips for hi-fi fans
- Handy ideas for the workshop
- *New Ideas Section* to test and challenge your imagination with a staple gun

Swingline INC., LONG ISLAND CITY 1, NEW YORK

PRINTED IN U.S.A.



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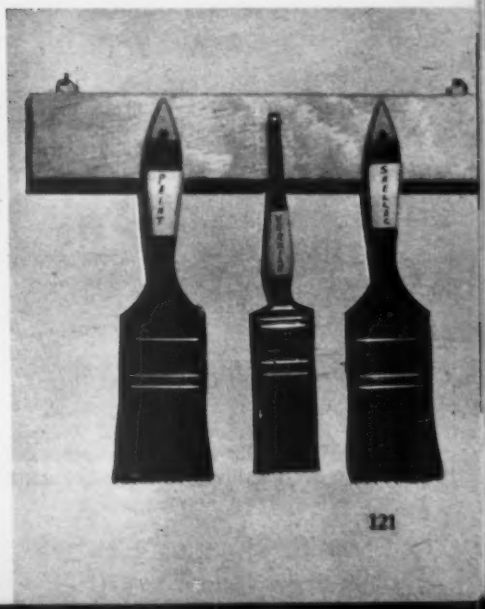
FRESH PAINT TIPS

AVOID LAP marks when you cannot do an entire room in a day by stopping your work at the intersection of two walls.

PINE STRIPS, ¾x1 inch, screwed around the edge of a stepladder shelf will keep paint cans from tumbling onto the floor.

KEEP A RECORD of a paint mix if you want to go back to the same particular color. Label the can as shown in photo above.



A LABEL on a single purpose brush will promote correct use by the owner and discourage casual borrowers from misusing it.

FLAT-BOTTOMED boat has no propeller to foul in weeds, lily pads or other growth.

Build POGO

—a paddle wheeler that skims over shallow waters at 9 mph.

By Harry J. Miller

POGO isn't a boat for navigating rough waters, but 15-year-old Jimmy Tench of Bradenton, Florida, had no such intention when he designed her. For his hobby of gathering orchids and exploring the placid bayous near home, he needed a boat with shallow draft and a propulsion system that wouldn't foul in the dense growth of mangrove, hyacinth and grass. Thus he produced this flat-bottomed paddle

wheeler which skims over the watery vegetation and takes him right up to the shores bordering the inlets.

The little boat moves along, too. Jimmy heads her up the Braden River at a 9 mph clip under the thrust of an old 3-hp mower engine which he bought in a junk yard for $15 and overhauled himself, spending another few dollars for new rings and gaskets. His total cost for the boat and engine came to just $50.

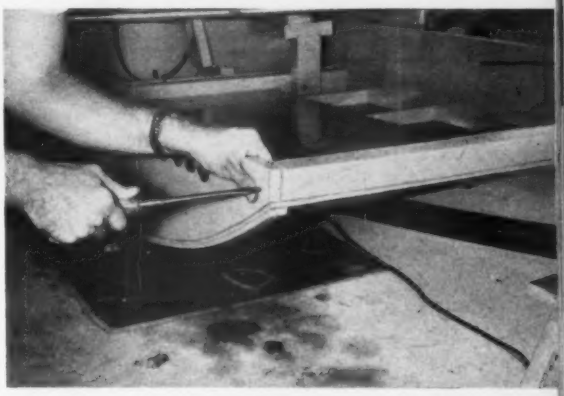
Thought out and built in six weeks of spare time, Pogo is quite simple in construction. A 4x8-foot sheet of quarter-inch exterior plywood provides the bottom, with some left over for the spray shield. The sides are two six-foot lengths of 1x10-inch fir, cut to the shape indicated in the drawing. The transom is another piece of 1x10-inch fir, cut to the dimensions shown, and a beveled piece of 2x4 stock is used at the bow.

First assemble the frame, which consists of transom, sides and bow piece. Use waterproof glue and 1½-inch brass or galvanized screws at each joint. Then install the plywood bottom, using glue and Anchorfast copper nails. Note that the 48-inch-wide bottom does not cover the full width of the frame. Center it on the transom and work forward, allowing the frame to project equally on each side. When you reach the bow curve, the bottom may be bent easily by soaking it with hot water and clamping it until the fastenings are in.

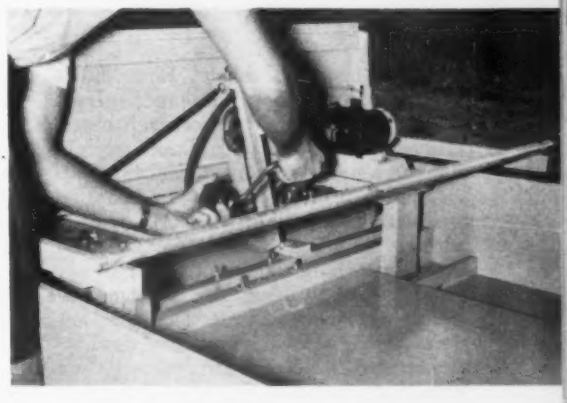
Next the reinforcing strips are installed on each side. These strips also should project beyond the bottom so that the outside edges are flush with the sides. Use glue and 1¼-inch screws to secure the strips and, when the job is done, fill the recesses between the strips and the sides with calking compound.

With the hull complete, the 2x4 engine supports and the 2x2 bat-

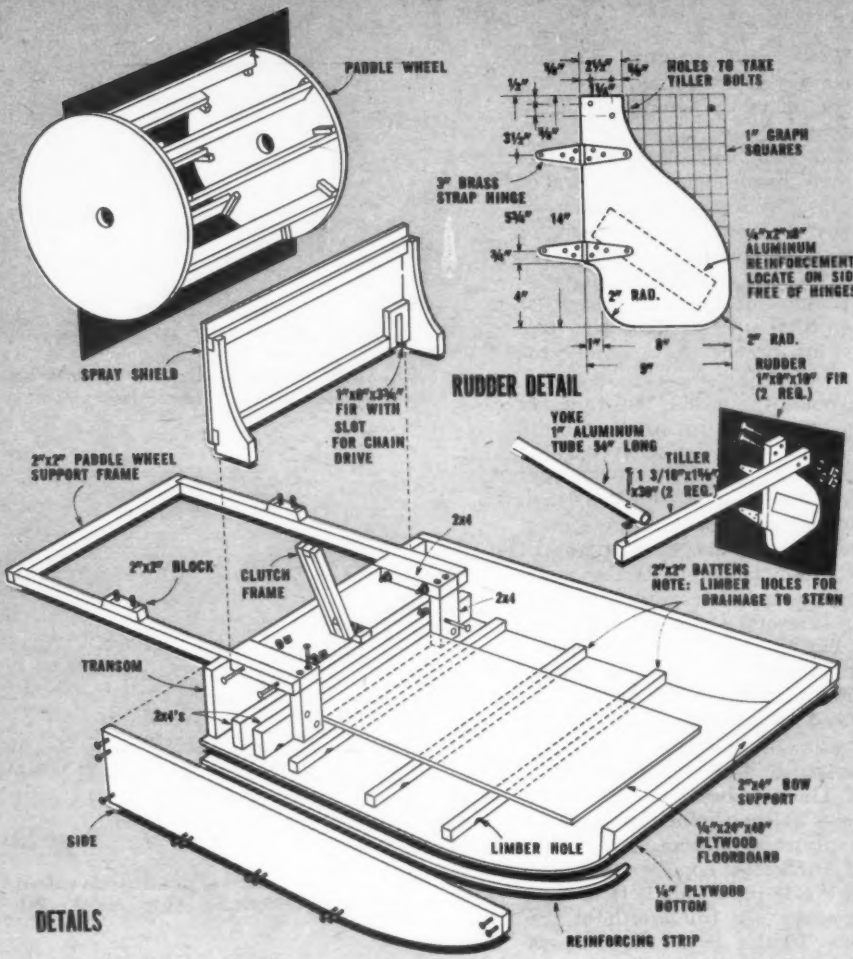
CALKING compound fills the recesses between sides and bottom reinforcing strips.



SCREWS are countersunk and heads calked over. Note reinforcing strip installation.



STURDY 2x4 platform is provided for engine, clutch and the 10:1 reduction gear.

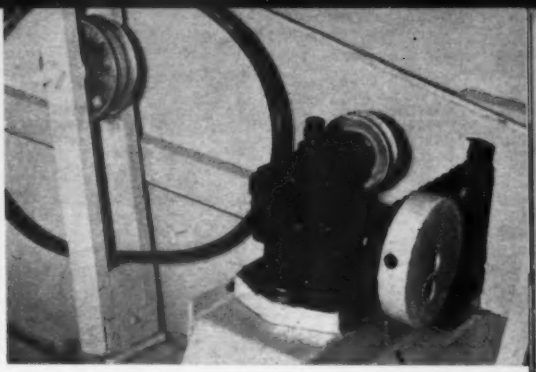


tens are installed inside. First cut a ¼x1-inch notch about three inches from each end in the bottom of each piece. These limber holes will allow water to run the length of the hull and flow out through a drain which is later installed in the transom. The 2x4's are secured with glue, screws through the sides, and four extra-long lag bolts which are passed through from the bottom and double as engine mounts. The 2x2's are simply glued and screwed from the bottom and sides. Notching the transom and installing the paddle wheel support frame completes the basic structure.

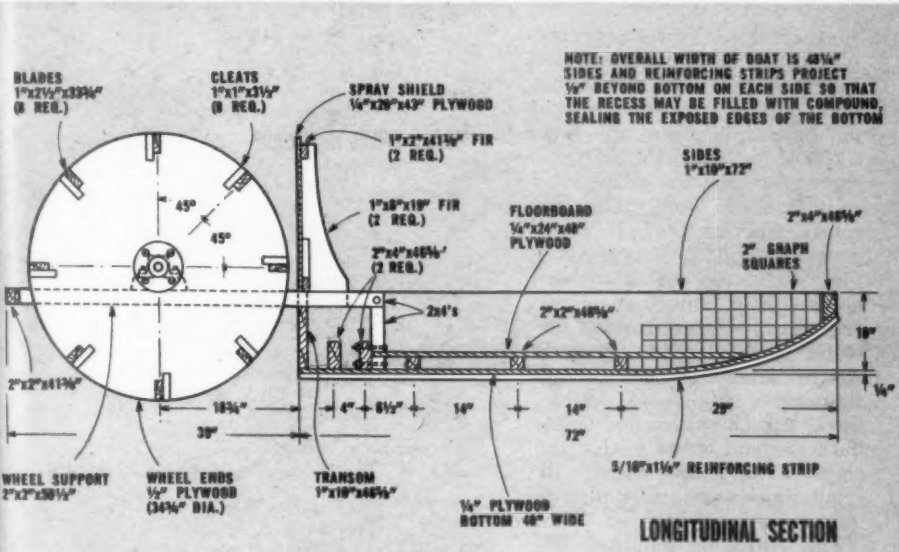
The ends of the paddle wheel carry eight blades spaced equidistant around their perimeters. The blades, 1x2½-inch fir, are set on 1x1-inch cleats for added strength at the joints. A detail shows the half-inch steel shaft assembly which passes through the middle of the wheel and terminates in pillow blocks mounted on the support frame.

To decrease the speed of the paddle wheel and permit mounting of the engine in the center of the boat, Jimmy used a series of reductions. A 10:1 reduction gear which came from an old piece of machinery in a junk yard was bought for five dollars. Between this gear and the paddle wheel, a 3:1 reduc-

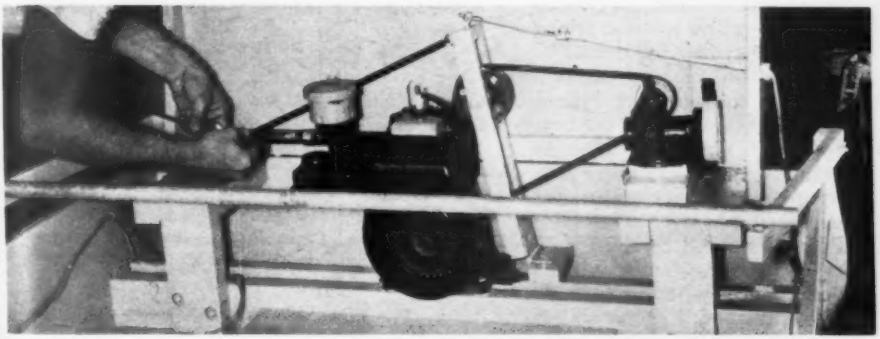
TWIN RUDDERS are installed with 3-in. strap hinges at the ends of the transom.



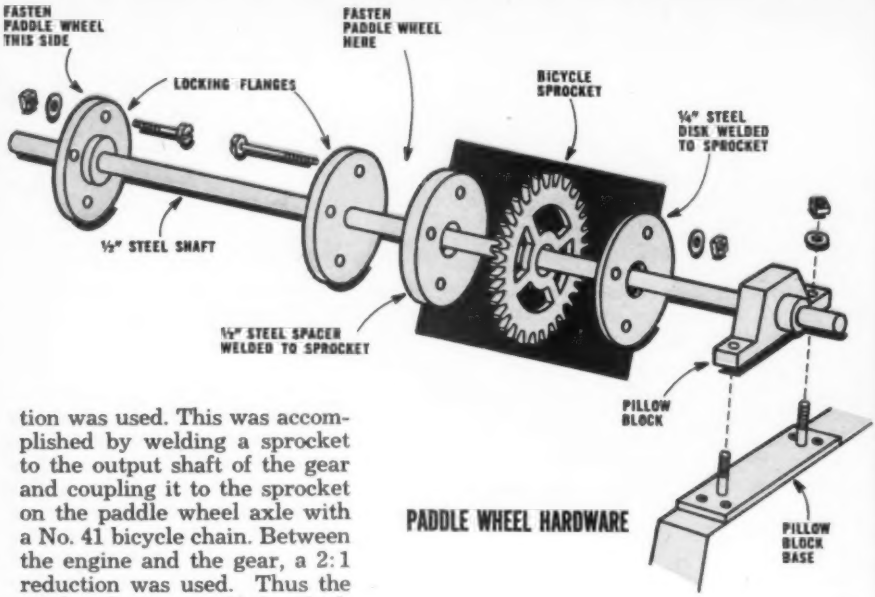
REDUCTION GEAR is a right-angle type; bicycle chain passes through spray shield.



LONGITUDINAL SECTION



MOUNTING of engine, spring-loaded clutch frame and reduction gear are shown above.

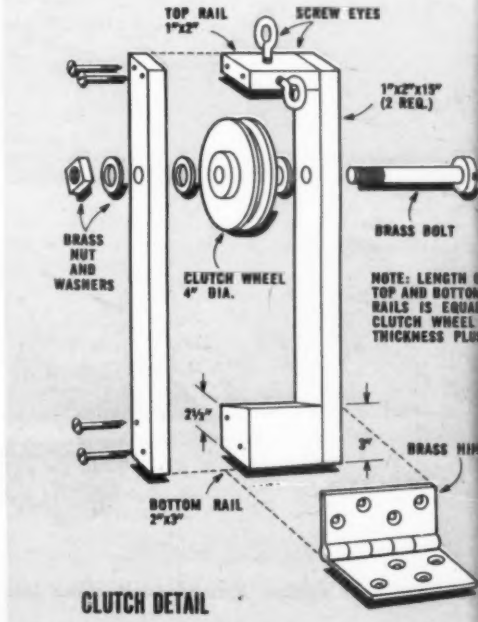


PADDLE WHEEL HARDWARE

tion was used. This was accomplished by welding a sprocket to the output shaft of the gear and coupling it to the sprocket on the paddle wheel axle with a No. 41 bicycle chain. Between the engine and the gear, a 2:1 reduction was used. Thus the total reduction is 60:1, which properly loads a Briggs-Stratton Model 6-S or equivalent engine. For convenience, two engine controls are carried forward. A cable leads to a throttle control lever mounted on one side and a single-pole, double-throw switch is installed below the lever and wired so that the engine may be stalled by grounding out its spark plug to the engine housing.

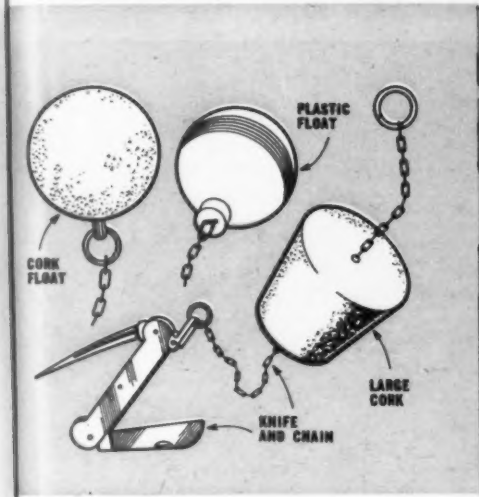
The clutch is mounted between the engine and the gear and is essentially a spring-loaded idler wheel operating inside a pivoting wooden frame that is controlled by means of steering cable passing through pulleys to the bow. A refinement here would be a rubber-faced brake mounted in conjunction with the clutch to prevent creeping when the clutch is disengaged.

Pogo is steered by dual rudders, has a spray shield which deflects paddle wheel spray and a sheet plywood floor on which Jimmy sits as he wends his way around the waterways. •



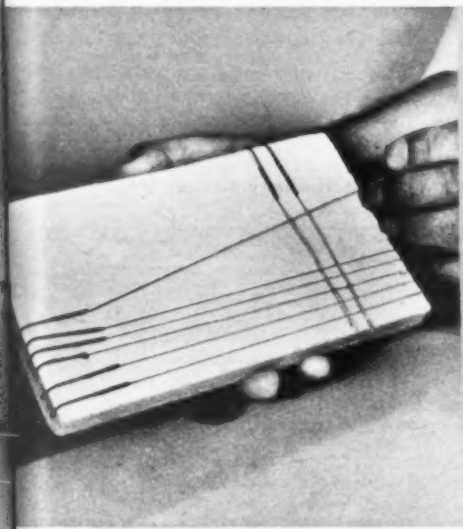
CLUTCH DETAIL

Boating and Fishing Tips

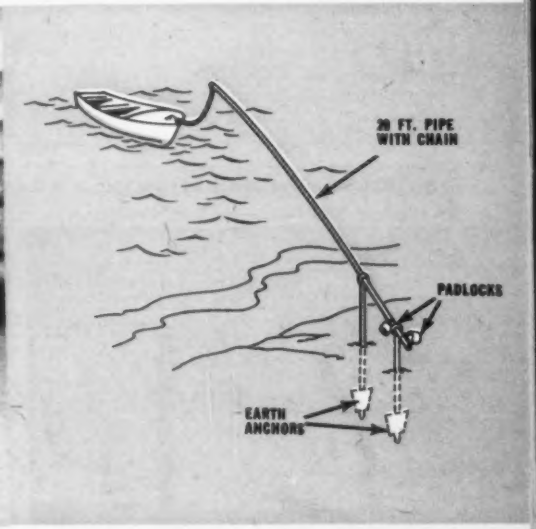


CORK or plastic float attached to knife keeps it from sinking if dropped in water.

PEGBOARD ceiling (hull liner) lets rot-preventing air circulate, accepts hangers.

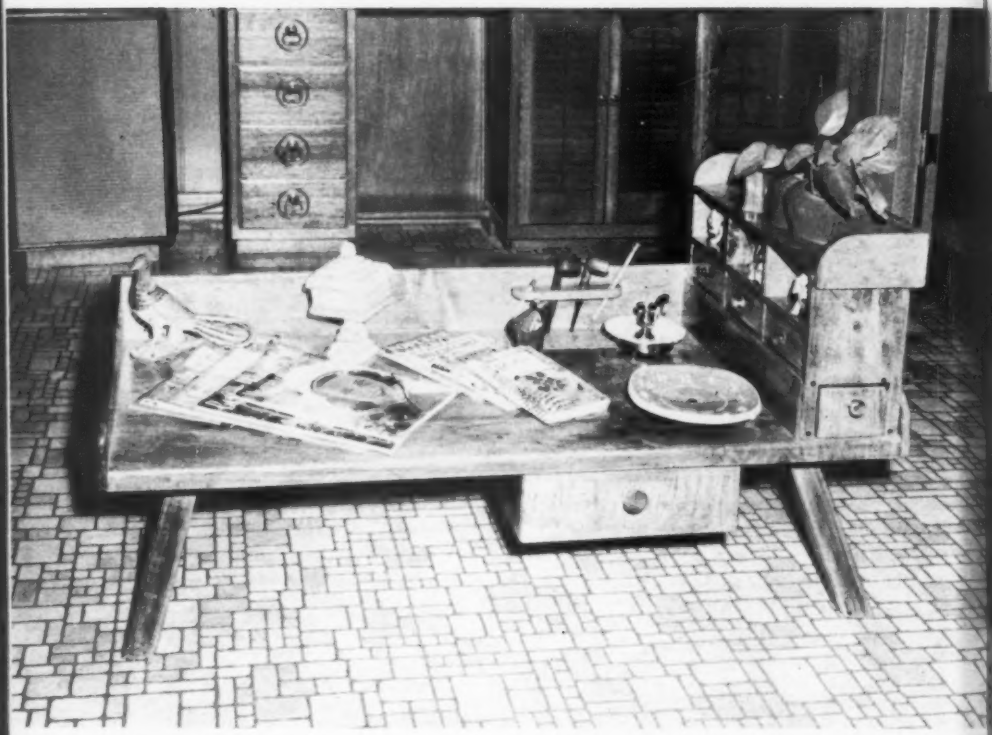


HOOKS are safe in a piece of fiberboard ceiling tile. Make razor slits for snells.



MOORING for a small boat is excellent in sheltered water where there's no tide.

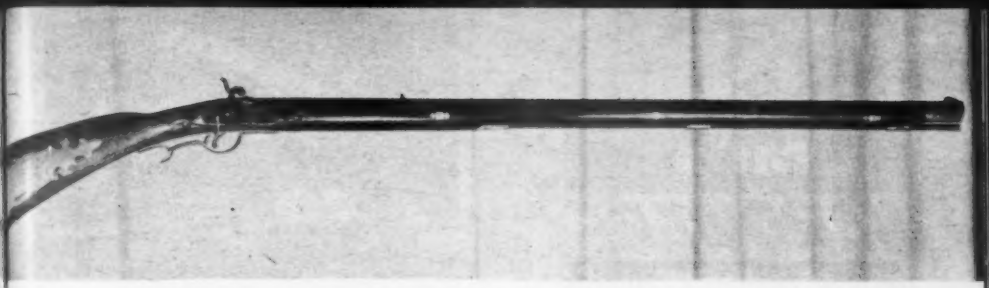
Golden Hammer Award Winners



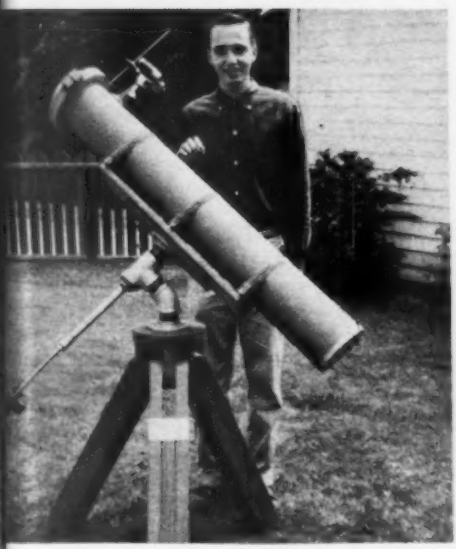
ANTIQUE cobbler bench of rock maple is the work of B. M. Hackney, College Station, Texas.

TELEPHONE SET was high-school project by student James Titus, Sioux City, Iowa.

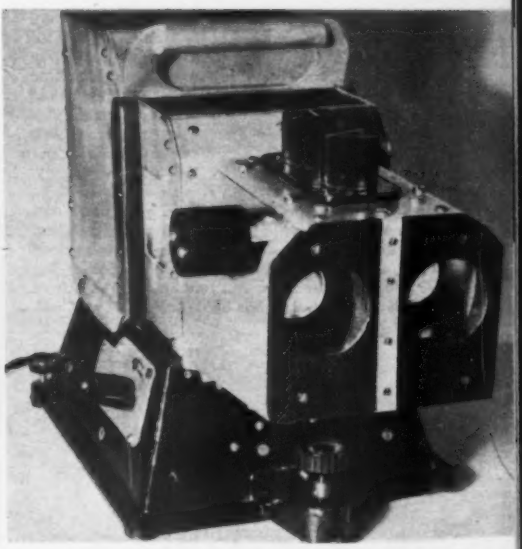
DEBUT in boat building was a success for P. O. Strandelius of Ramsayville, Ontario.



PERCUSSION LOCK RIFLE made by hand, including drilling of barrel, cost Paul H. Adams, USNR, New York, N. Y., less than photographer's fee.



NEWTONIAN six-inch reflecting telescope has camera holder (see top end) designed by builder Bob Waaland of Burlingame, Calif.



STEREO slide projector designed and made by Neal DuBrey of Durban, South Africa, has twin lamps, calibrated lens adjustment.

STONE extension to existing home is the result of a joint effort by Mr. and Mrs. Ted Scholtz and son, Eldorado Springs, Mo.

The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their projects:

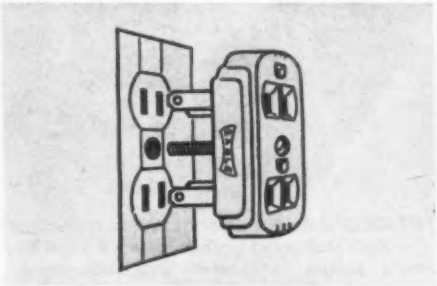
Gordon L. Ackers, White Haven, Pa. . . Robert L. Marascio, Holbrook, L. I., N. Y. . . D. T. Clapp, Brockton, Ill. . . Ronald Ten Elshof, Grand Rapids, Mich. . . J. Drobny, Berkeley Heights, N. J. . . Darrel O. Neidigh, Jr., Newark, Del. . . Stanford Hallam, Allison, Pa. . . A. J. Froehler, Calgary, Alberta. . . Henry A. Roy, Sr., Peabody, Mass. . . J. B. Ivy, Glen Rose, Tex. . . Bernard A. Stafford, West Hartford, Conn. . . F. E. Hite, Huntington, W. Va. . . Andrew F. Mencel, Jr., Bridgeport, Conn. . . Marie B. Mason, Alameda, Calif. . . John Gordon Sykes, Victoria, B. C. . . Nicholas F. Tocci, Bayonne, N. J. . . Stanley H. Shur, Springfield, N. J. . . Ed Ski, Haddonfield, N. J. . . Uless O. Elben, Decatur, Ill. . . Marshall D. Duhaime, Jr., Milford, Conn. . . James N. Hill, Abingdon, Va. . . Douglas A. Biesecker, Clark's [Continued on page 160]

MI's HARDWARE STORE

Suggestions on using aluminum for picture framing can be obtained from Reynolds Metals, Dept. PRD 38, Richmond, Va. . . For a catalog of handbooks for home craftsmen write to the Rockwell Mfg. Co., Delta Power Tool Div., 484 North Lexington Ave., Pittsburgh, Pa. . . A guide to installing ceiling tile can be had on request from The Armstrong Cork Co., Lancaster, Pa. . . "New Concept," a new floor tile has been developed by the Mastic Tile Div. of the Ruberoid Co., 500 5th Ave., New York, N. Y., which is claimed to be as durable as asphalt and easier to clean. . . A handy, British-made awl and screwdriver combination, the Awlscrew, priced under $3.00 is available from Vi-Jo Sales Co., P.O. Box 287, Geneva, Ill., and in the West from H .V. Mollenkopf, P.O. Box 3391-A, Van Nuys, Calif.

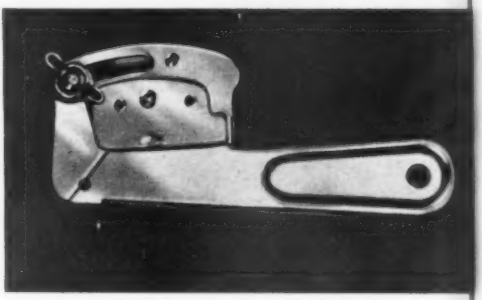
WANTZ KLEENSTEAM de-mineralizes water for steam irons, vaporizers. Sells for 98 cents.

Illinois Water Treatment Co., Rockford, Ill.



DOUBLE GROUND TAP adapter converts any receptacle to a grounded-type outlet.

Eagle Electric Mfg. Co., Inc.,
23-10 Bridge Plaza South, Long Island City 1, N. Y.



JAK-NIFE scraper has single edge razor blade which locks at a variety of angles.

Red Devil Tools, Union, N. J.

CRYSTAL-3 cleans stainless steel, copper and porcelain. 8-oz pack costs 98 cents.

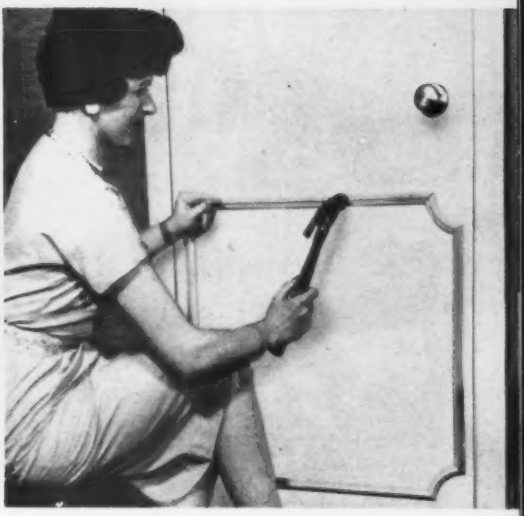
Leon Chemical Industries, Inc., Grand Rapids, Mich.

SPONGE CLOTH for general household use is re-inforced with a web of strong fibers.

E. I. Du Pont de Nemours and Co., Wilmington, Del.

MOLDED PLASTIC DRAWERS do not swell or warp. Round corners make cleaning easy.

Amos-Thompson Corp., Edinburg, Ind.



DOOR MOLDING KIT at $8.88 enables the novice to give character to flush doors.

Bendix Mouldings, Inc., 192 Lexington Ave., New York, N. Y.

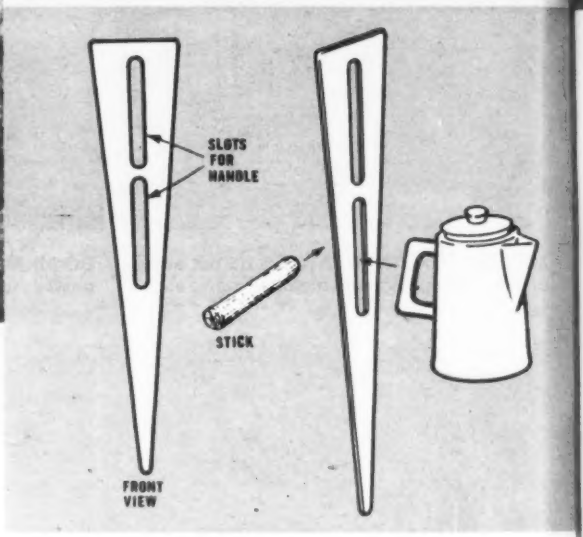
DROP CORD SET features grounded outlet in handle and grounding type molded plug.

Cordomatic Div., The Vacuum Cleaner Corp. of America, 17th and Indiana Ave., Philadelphia, Pa.

DASCO CLAW BAR has cat's paw nail claw and straight spike-pulling blade. $1.98.

Damascus Steel Products Corp., Rockford, Ill.

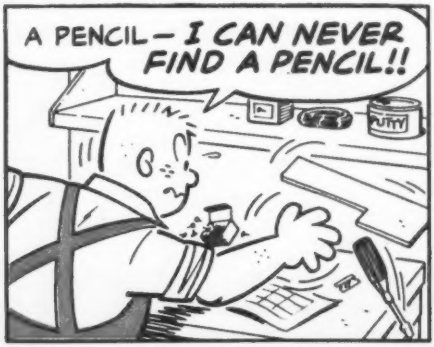
HOME AND SHOP SHORTS

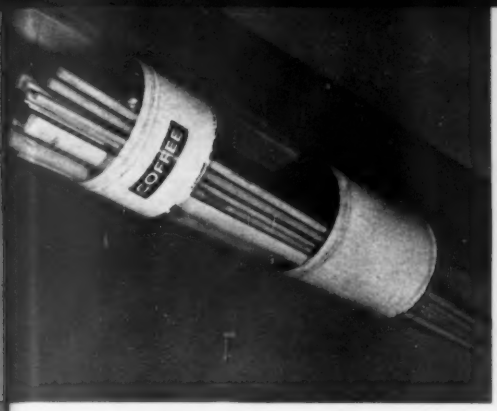


CAMPER'S COFFEE POT can't tip over when it's supported by this aluminum Camp Crutch that sticks into the ground beside the fireplace. This is end of the Tippy Spilly Rock Campaign!

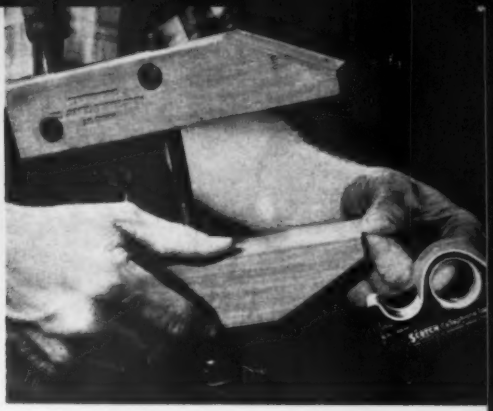
Send Freddie Fumbles your idea of a good short-cut, time-saver or safety device in your work, whether it be in the home, shop, office or farm. Each tip accepted will be paid for at the rate of $10. Naturally we cannot acknowledge or return the ones we cannot use. However all will be carefully read and evaluated. (Those which we can use in other departments of MI will be paid for at our regular rates.) Please send in your ideas on a postcard only. Address to Freddie Fumbles, *Mechanix Illustrated*, 67 W. 44th St., New York 36, N. Y.

FREDDIE FUMBLES

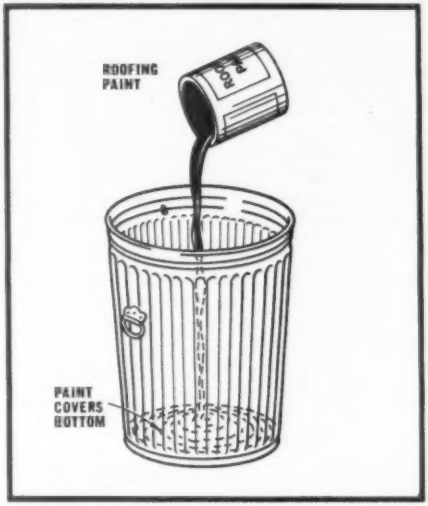




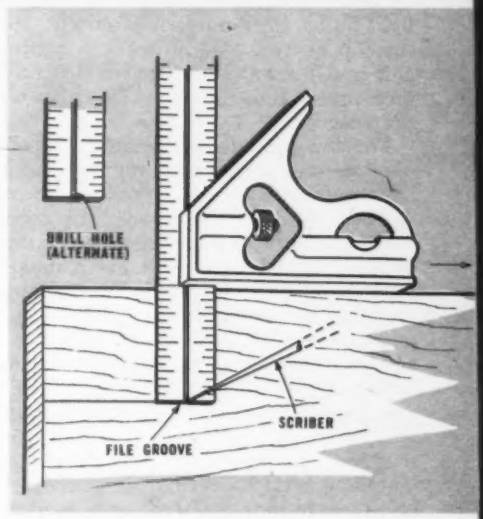
NAIL two empty cans, with both ends removed, to an overhead joist in your workshop and store your doweling stock in 'em.



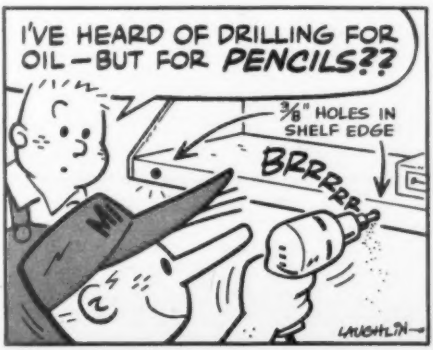
WHEN CLAMPING glued stock, cover jaws of the clamp with cellophane or masking tape to prevent glue from sticking to them.



RUSTPROOF metal trash cans by pouring in heavy asphalt paint to coat the bottoms; then use a brush to paint up sides.



A HOLE OR NOTCH made in end of combination square will admit point of scribing tool for making parallel lines on stock.



Glass HANDLE WITH CARE!

By Robert Hertzberg

PULL *straight* out! Push *straight* in! *Don't twist!* In nine cases out of ten a television, radio or hi-fi set stops working because a single tube is failing or has already burned out. The average owner, in trying to remove the tubes for testing, too often makes real trouble for himself by trying to unscrew them like electric light bulbs. If he puts some muscle into the job he can readily break a socket and find his hand bleeding from shattered glass. Remember: radio tubes do *not* unscrew.

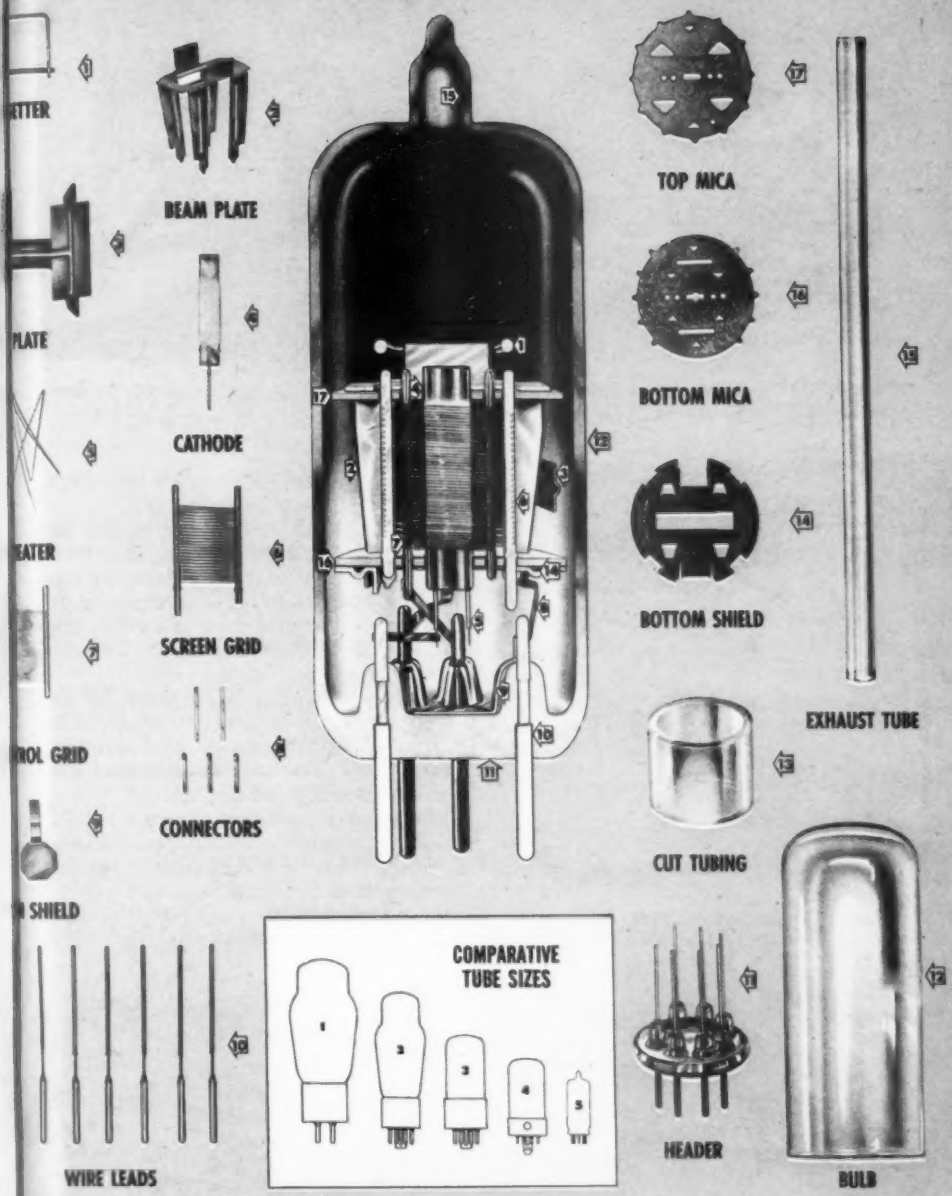
For the past decade, manufacturers of electronic equipment for the home have used two general types of tubes: the *octal* and the *miniature*. The octal may have either a metal or a glass bulb. It is so named because it has a maximum of eight pins, evenly spaced and mounted in an insulating base. These pins are very strong and are rigidly anchored in the base. Extending from the center of the base and about ⅛-inch beyond the ends of the pins is an indexing stub of insulating material with a protruding "key" molded onto it. The matching octal socket has eight contact holes for the pins, and a center hole with a keyway for the stub. Inserting any octal tube into its socket is a simple operation that takes about two seconds. Let the stub drop into the socket hole. Without exerting any downward pressure rotate the tube until you feel the key drop into the keyway. Then press in firmly to seat the tube.

The pin contacts of some octal sockets are quite tight. To loosen a stubborn tube wiggle it *very slightly* while pulling it, or insert a screwdriver blade between the base and the socket and *gently* wedge the tube out.

Not all tubes fitted with octal bases require eight external connections. As a matter of manufacturing economy any unneeded pins are merely left off. So don't think a tube is defective if it has only five, six or seven pins and blank holes where the others should be.

While octals are rugged and fairly easy to handle, miniatures are generally a not-so-miniature pain in the neck.

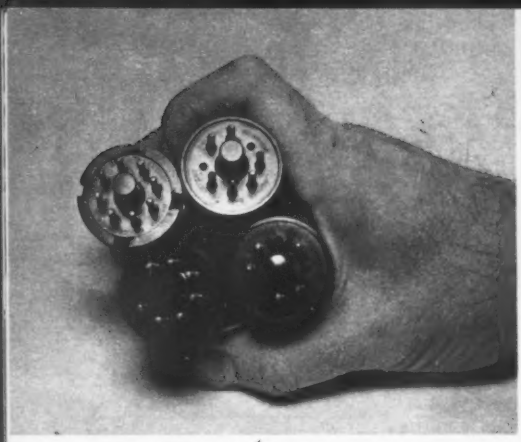
Ever wonder what makes a radio tube tick? Well, the heart of an electron tube is the cathode (4), a tiny, hollow sleeve coated on the outside with chemicals that emit electrons when heated. The heat is provided by heater wires (5) on the inside of the sleeve. Surrounding the cathode is at least one open-mesh grid (7) of fine wire wound around vertical supporting pins; the one nearest the cathode is the control grid and the others may be designated as screen grid (6), suppressor grid, etc. The outermost element in all tubes is the plate or plates (2, 3). Made of thin sheet metal, they surround the cathode-grid assemblies. The two ends of the heater, and one end of each of the grids and plates, are linked by short connectors (8) to the wire leads and base pins (10) that constitute the insulated header button (11). The pin shield (9) is a bit of metal placed in the center of the header and connected to the cathode or to a ground pin. Air in the glass bulb (12) is evacuated through the exhaust tube (15). The getter (1) is a small bar or ring of special metal which, by flashing or glowing, absorbs minute pockets of air or other gasses that might remain on the metal elements. The spacing between elements is maintained by elaborately shaped supports of mica and metal (14, 16, 17).



COMPONENTS are arrayed around enlargement of modern radio tube. Inset shows progressive miniaturization of tubes through the years.

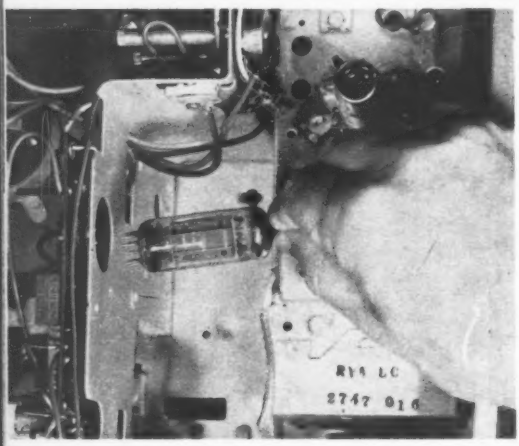
These tubes are made entirely of glass. There are two sizes: a small one of seven pins and a slightly larger one of nine pins. All pins are present in all miniatures and are molded directly into the bottom of the glass shell (called an "envelope" in the trade). The spacing between pins 1 and 7, and 1 and 9—slightly wider than the uniform spacing between the others—is the only indexing mecha-

Drawing by Sylvania Electric Products, Inc.



OCTAL TUBES have up to eight pins in insulating base around indexing stub.

DON'T remove an octal tube by its connector cap; the cap may pull off instead.

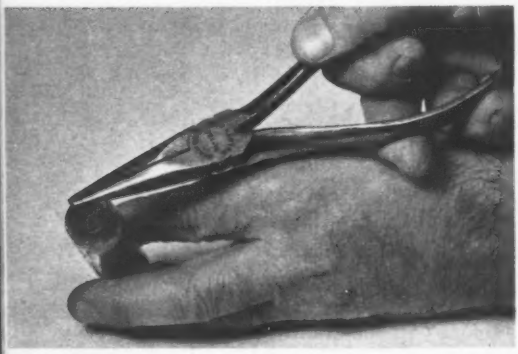


TO REPLACE miniatures: Pull 'em straight out! Push 'em straight in! Don't twist 'em!

nism for guiding these tubes into their sockets.

The pins of miniatures must be straight and parallel to line up accurately with the matching holes in the sockets. Insert a miniature carefully or else one of the pins may slip off to the side a bit and then curl up when the tube is pressed in.

When working in a crowded TV or radio chassis be very careful not to push against these little seven- and nine-pin tubes. They give 'way readily, and the movement often causes "opens" in the sockets. Frequently the mere act of wiggling a tube in its socket will restore the contacts and cause a silent set to spring back to life. Whenever a miniature is removed from a piece of equipment its pins [*Continued on page* 160]



NEEDLE-NOSE PLIERS should be used when straightening bent pins on miniature tubes.

RADIO AND TV BUFFS with their own tube testers can check their tubes in minute.

Photo courtesy Superior Instruments Co.

CHOOSE YOUR JOB TRAINING–THEN LEARN BY DOING

Challenging work—if you can get it. To land a job as a Bulldozer Operator, you need training. The kind of training you get through the Army Choose-it-Yourself System.

If you qualify (by passing aptitude and physical exams), this system lets you choose your job training before you enlist.

On-the-job or in school, Army training is practical. You learn by doing. The skills you absorb can pay off for the rest of your life.

You can choose from many different kinds of job training. Construction Machinery Operation is one possibility.

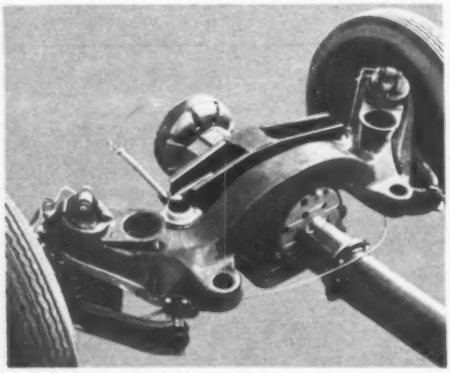
There's also Telephone Maintenance, Missile Operations, Administration, Military Police, Radio Relay & Carrier Operation—to name a few. Ask your local Army recruiter to show you a complete list.

Can you qualify for the job training you want? It's easy enough to find out. Before enlistment. Without obligation.

CHOOSE-IT-YOURSELF VOCATIONAL TRAINING SYSTEM **US ARMY**

Test your automotive I.Q!

QUICK QUIZ BY QUAKER STATE



1. *Can you name this type of drive, recently introduced in America?*

2. *What does this symbol stand for?*

The symbol stands for complete engine protection. Quaker State Motor Oil, super-refined from 100% Pure Pennsylvania Grade Crude Oil, keeps your car on the road, out of the repair shop. Insist on Quaker State—available most everywhere. For your nearest dealer's name, call Western Union Operator 25.

ANSWERS: 1. *Transaxle (illus: 1961 Pontiac Tempest).*
2. *Complete engine protection.*

QUAKER STATE OIL REFINING CORP., OIL CITY, PA.

Live It Up...Outdoors

[*Continued from page* 105]

to embark on the ornamental brickwork. Dampen bricks before use, mix mortar carefully to give it the proper plasticity and use the bubble level frequently to check the alignment of the bricks. A block of wood used as a spacing guide assures accuracy. With the experience gained in laying this lattice brickwork the bench and fireplace will be easy.

The concrete cappings for bench and walls were pre-cast in simple forms made of wood. Half-inch hardware cloth was embedded in each length for reinforcement. A rather stiff mortar mix is needed for laying the heavy slabs as their weight will squeeze out a mushy mixture.

The size of the cast-iron grates determines the dimensions of the opening in the top of the fireplace. Firebrick and a two-to-one cement mix was used between upper and lower grates as a lining. A chimney is not required as the fireplace is only intended for charcoal.

The laying of the "floor" was greatly simplified by Tatko flags which are pre-cut and come in a variety of colors. Working an area of ten square feet at a time, smooth a one-inch layer of concrete (3-to-1) over it, then sprinkle with dry cement. Butter a mixture of cement and water (no sand) on the backs of the tiles and put in place. Tap and level to make a perfect bond. When set, point up joints with a two-to-one sand and cement mixture. Drops of cement which have hardened on the surface of the flags may be removed later with muriatic acid.

The rough stucco garage wall was resurfaced with Masonite Sunline Siding. Panels are fastened with aluminum nails for which pilot holes must be drilled as the material is tough. Finished off in two colors, it makes an attractive wall and completes the heavy work.

It is time to reap the fruits of one's labor. Imagine the scene, the family's pleasure, the admiration of friends, as they gather round, lured by the scent of hamburgers cooking over charcoal. Enjoy, enjoy! •

When answering advertisements please mention MECHANIX ILLUSTRATED

Glue it right the first time with the right Weldwood Adhesive

Quick, clean Presto-Set® Glue, the all-purpose glue, bonds paper, wood, cloth, china. Dries fast, won't stain. Handy new bellows-action squeeze bottles with spreader tops. From 39¢.

Bonds instantly on contact. Weldwood Contact Cement permanently bonds plastic, leather, and wood. Needs no clamping, and is water-resistant. Stays flexible. From 29¢.

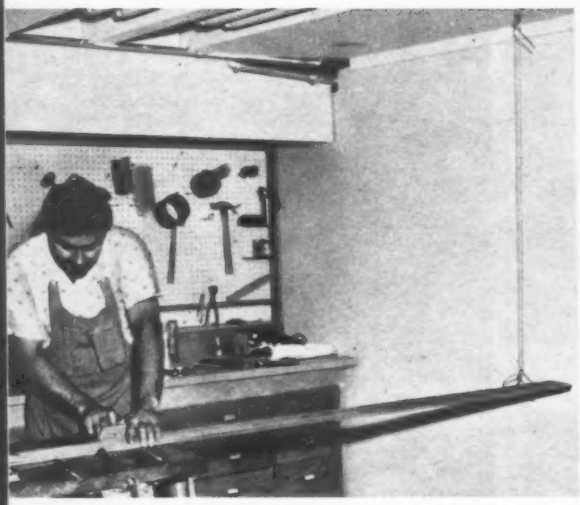
Strongest of them all is Weldwood Plastic Resin Glue. For heavy-duty jobs. Makes joints even stronger than the wood itself. Mixes instantly, is water-resistant. From 40¢.

Waterproof and best for lawn furniture, boats, Weldwood Waterproof Resorcinol Glue makes a powerful bond on most porous materials. Resists rot, fungus, heat, cold. From $1.15.

Put it together *permanently* with the Weldwood® Adhesive made for the job. Better still, keep all 4 Weldwood Adhesives handy—then you're always ready for almost any gluing job. Your hardware, lumber, and paint dealers stock them all—pick up a supply soon.

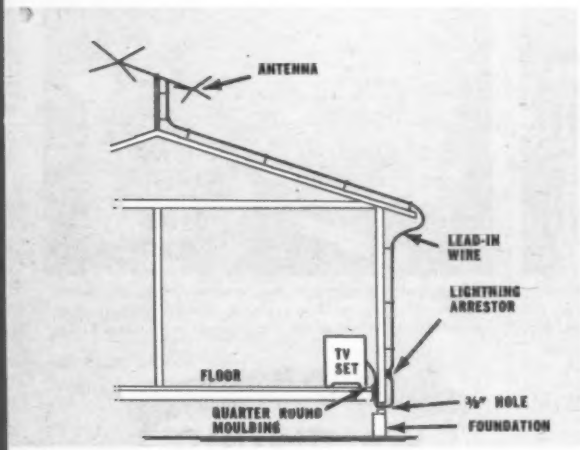
WELDWOOD
ADHESIVES
Products of United States Plywood

HOME HINTS



CORD FROM ceiling supports long board when crosscutting. Long radius and slack will prevent any effect on "square" of cut.

BOTTOMLESS measuring box holds exactly one cubic foot, is handy when minor concrete repairs are needed around a house.



ANTENNA LEAD-IN wire for a TV set is unsightly when brought through a window. Instead, bring it through floor as shown.

AVOID SMEAR when puttying a nail hole by pressing the putty in with your thumb and using a knife only to remove excess.

Weekend Painters get a break with a new kind of Latex House Paint!

If you're planning to paint the outside of your house this year, there's a new kind of house paint from "Dutch Boy" that can make your job a lot easier. It promises professional results to even first-time painters!

Until recently, the weekend or vacation painter had to wait for an extended period of good weather. Now new "Dutch Boy" Latex can be used even right after a rainstorm. And it's specially helpful for the stop-and-go kind of exterior painting that most homeowners have to do. With this remarkable new paint, you can pick up right where you left off. Lap marks won't show. Skips and holidays can be touched up any time.

Extremely easy to apply, there is no tiring brush-drag with new "Dutch Boy" Latex. On certain exterior surfaces, you'll find a roller works perfectly. This new paint literally flows on over wood and masonry – and it covers fast and evenly. This easy application means that two coats go on in little more than the time it takes to apply one of regular paint.

When repainting surfaces with "Dutch Boy" new Latex, there's no need for a separate oil-type primer with all its complications. Instead, you simply use the easy-to-mix additive, PBL, with the first coat... "Dutch Boy" does the rest.

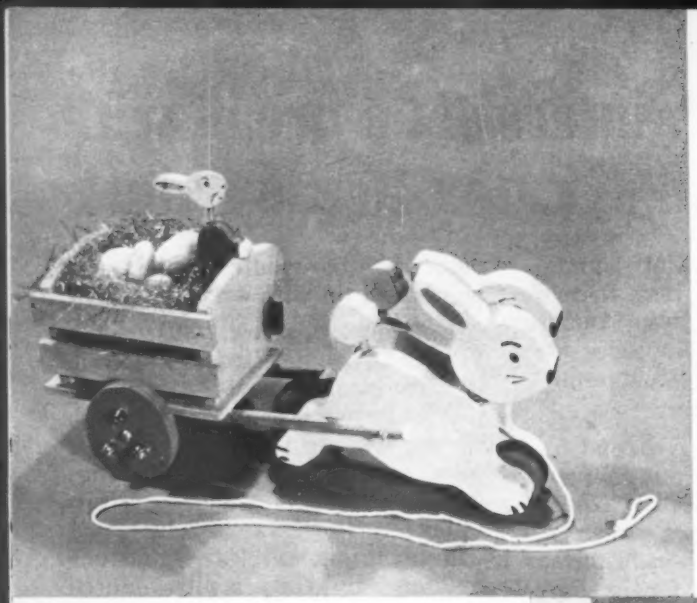
You have a paint job that dries, bug-free, in just 30 minutes. Add the second coat when convenient.

Messy solvents and thinners are unnecessary, too. Brushes and equipment – like the painter himself – can be cleaned up with soap and water.

Homeowners who have used new "Dutch Boy" Latex House Paint claim it ends exterior house painting as they've known it before. It's an easy, simple, low-cost way to have a complete exterior paint maintenance program. Once applied, new "Dutch Boy" Latex lasts for years and years. Colors will stay bright and clear. Simple one-coat touch-up is all you will ever need. The part of a house exposed to more severe weathering can be repainted at any time *without repainting the whole house*. So long as you keep the same color, your Latex program means that you may never again need to repaint the outside of your entire house at one time.

Properly applied, this new paint can eliminate most blistering and peeling problems caused by trapped interior moisture. New "Dutch Boy" Latex House Paint "breathes" – allowing interior moisture to escape yet sealing out the weather.

This new paint promises much to the do-it-yourself homeowner. Check with your nearest "Dutch Boy" Dealer listed in the Yellow Pages, or write for informative free booklet to:
NATIONAL LEAD COMPANY,
General Offices,
111 Broadway,
New York 6, N.Y.



LOTS OF ACTION makes this an appealing pull toy for a toddler. The lead bunnies hop along, shaking their heads and tails, while the little fellow bobs his head in the jogging candy cart at the rear.

TOYS FOR EASTER

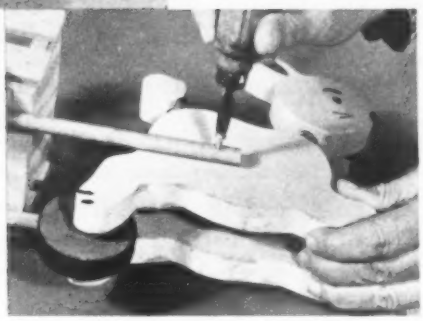
Active or noisemaking pull toys delight toddlers—and these two are easily made.

By Willard and Elma Waltner

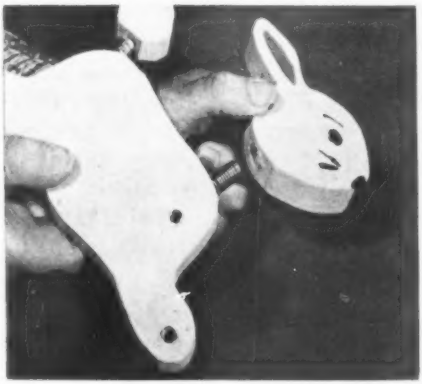
SMALL fry will love these special Easter toys. The cart-pulling bunnies hop along on an off-center back wheel, bobbing their heads and shaking their tails, while the hen cackles merrily as she's pulled behind a toddler. Both toys are easily made from scrap wood.

First cut, paint and assemble the bunny cart as shown in the drawing, attaching the wheels with roundhead screws and installing the shafts in holes spaced 1½ inches apart in the axle rod. The shafts are also nailed to the front end of the cart for extra holding power.

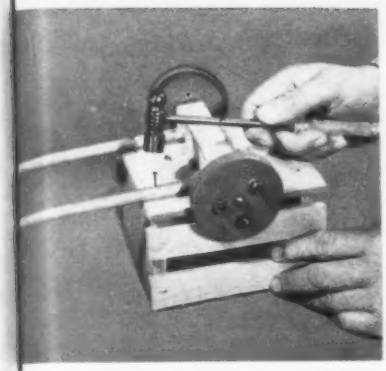
Parts for the bunnies are laid out on



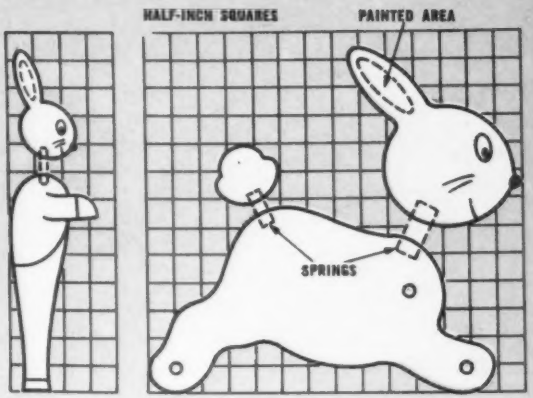
FASTEN the bunnies to the cart by passing screws through holes bored in shafts.

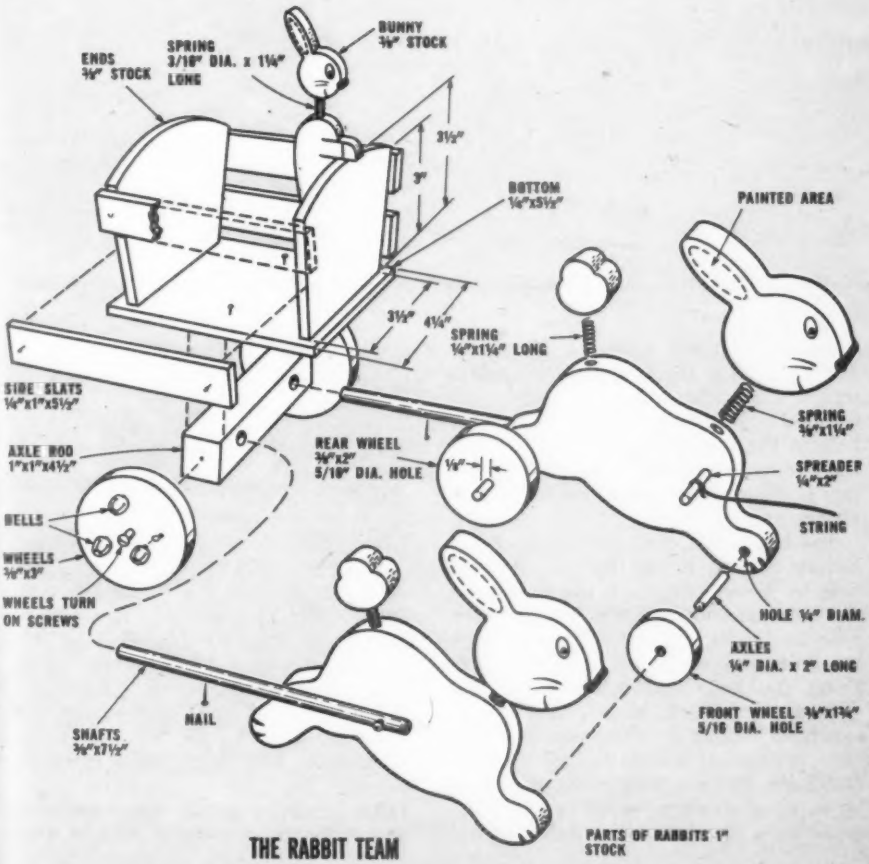


SPRINGS are wedged into holes of equal diameter bored in heads, tails and body.

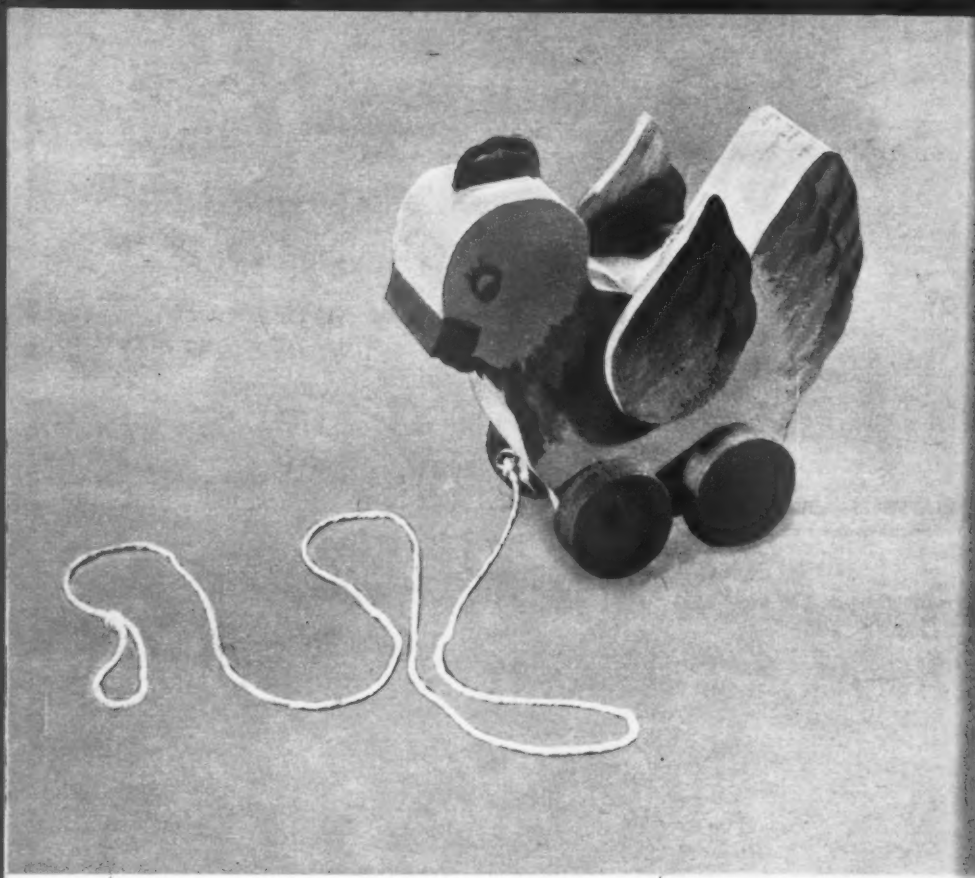


SHAFTS are glued into holes in axle and nailed to bottom of cart.





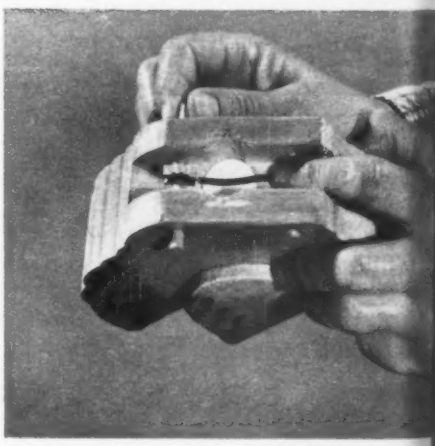
THE RABBIT TEAM



HEN clucks as it's pulled. An axle-mounted ratchet flicks spring against sounding board.

half-inch squares and cut to shape. After painting, the compression springs which hold the heads and tails are wedged tightly into the holes. The axle hole in the front wheel is centered but the one in the wheel between the hind legs is offset ⅛-inch from center to create the hopping effect.

The hen is laid out on two-inch stock. Before cutting it out, bore a one-inch hole to ¾-inch depth in the bottom at the location shown. Then increase this hole to 1½-inch depth with a ¾-inch bit. Next make a ¾x¾-inch dado cut along the length of the bottom. The sounding board, one-inch-diameter cardboard about the thickness of a post card, is glued at the opening of the one-inch hole. The clucking noise is caused by a piece of alarm clock spring activated by a plastic ratchet tightly fitted



TEST spring for correct engagement with ratchet before securing it with a staple.

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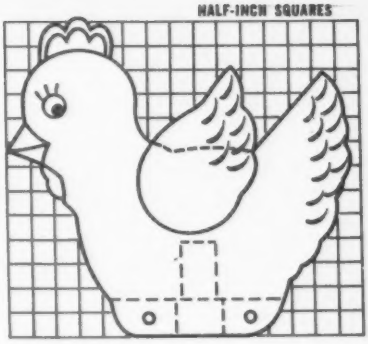
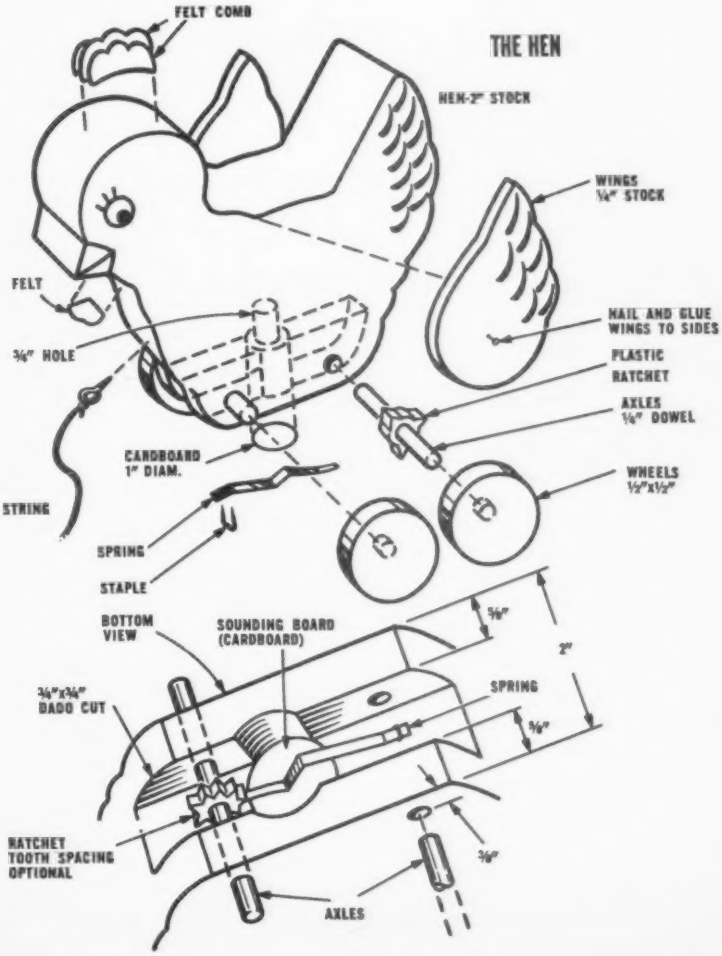
ga

and glued to the rear axle. To vary the pattern of the clucking, the teeth on the ratchet may be spaced any way you choose.

Note that the axle holes do not go all the way through the wheels on the hen; bore the holes about half way and then install the wheels on the axles with a drop of glue in each hole. The comb and wattles, of course, are not part of the wood body; they are each composed of three pieces of red felt which are glued on after the hen has been painted in gay colors. •





CAR CARE

Your New DODGE DART

In its second year this highly successful model offers improved styling and wider engine choice.

By Frederick C. Russell
Member, Society of Automotive Engineers

GETTING to know your new Dodge Dart can be as pleasant as the fun you'll get out of driving it. The car is not radical in design yet it has some interesting requirements by way of its care and feeding.

It can be had with choice of four transmissions and five engine options—the slant six, a V8, two power package engines and the D-500 ram induction job. This involves a choice of single downdraft carburetion for the slant six, a two-barrel downdraft carburetor for the V8, a four-barrel for the power package models and a four-barrel for the D-500. All but the basic six and V8 engines require premium fuel.

Dart, like the other Chrysler products, solves a lot of cold weather problems because an alternator instead of a generator is used. Caution is needed when installing a battery, attaching a battery charger or using the battery of your second car to start the Dart's engine. Excessive voltage or reversed polarity can raise hob with the car's electrical circuits. Dodge warns against using a fast charger to boost starting voltage and stresses the point that during fast charging both of the car's battery cables must be disconnected. Reversal of polarity will instantly burn out the wiring harness and may damage the alternator as well.

All manufacturers have difficulty with engine parts being so close as to interfere with each other. Typical is the inadequate clearance on

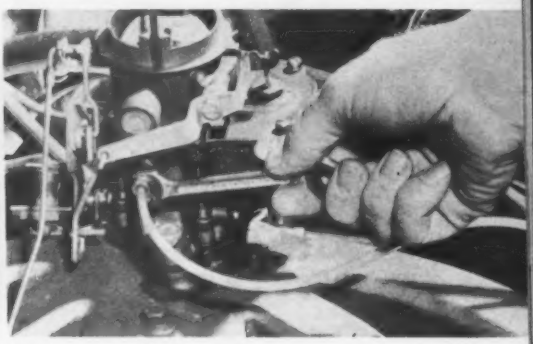
early 1961 Darts between the lower radiator hose and fan belt. A new hose retainer clip, mounted at the chain case cover bolt location solves this. Protection against accidental grounding of the alternator output can be provided by merely installing a vinyl boot cover. This is attached to the alternator's output wire and then placed over the stud.

For Dart the Dodge folk offer choice of the range of SAE oils from 5W for below 10° F to SAE 30 for temperatures above freezing as well as the range of SAE multi-viscosity grades. Don't make the mistake of thinking that SAE 10W-30 oil will do for all temperatures. There are the sub-zero SAE 5W-20 as well as SAE 20W-40 for the upper end of the scale.

Aware of the importance of matching lubricants to temperature conditions Dodge engineers recommend using 1¼ pints of refined kerosene in the Torque-Flite Six transmission in extremely cold weather, but caution against forgetting to drain off this mixture as soon as the emergency passes, replacing with the regular Type A automatic transmission lube.

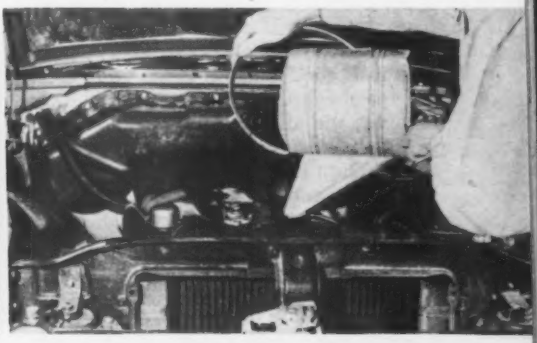
In the 225 cubic-inch six-cylinder engine changes have been made in the synthetic rubber oil pan rear gasket so that sealing is improved. There are five prongs instead of the original four and in new locations. Incidentally, if engine

FOR VENTILATION press fresh air button with temperature lever swung to the left.

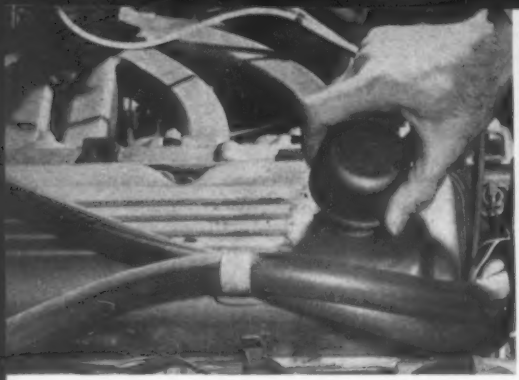


ALWAYS REMOVE vacuum advance line to distributor when setting ignition timing.

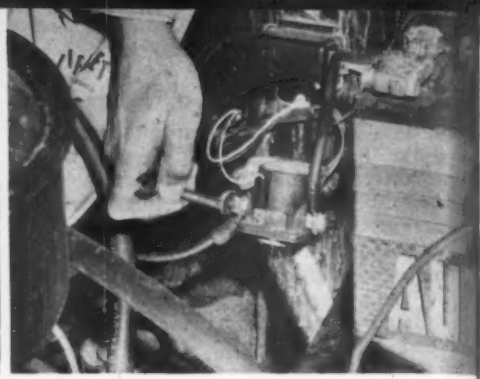
LUBRICATION of speedometer housing is through oil wick under instrument panel.



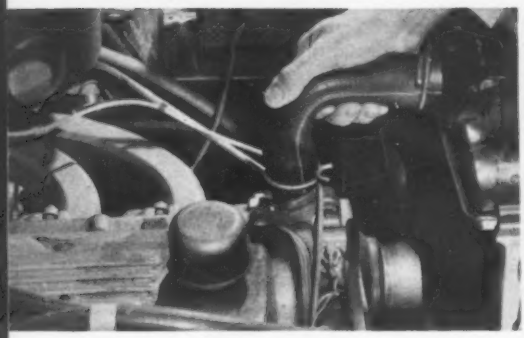
COOLING SYSTEM capacity of Dart engine is 12 quarts for the six, 21 for the V8.



OIL-CHANGE is time for giving kerosene wash to air cleaner in the oil filler cap.



ELECTRICAL connections need regular checking, should be kept clean and tight.



HOSES should be examined for cracks and leaks and replaced if porous or cracked.

TO JACK rear wheel, position jack's pad underneath and well to the end of bumper.

oil leaks out through the vent holes in the bottom of the distributor housing of the six or V8 motors remove the pin and gear (or collar) and carefully inspect the shaft. Drilling a new hole 90° from the original hole and installing the pin into the new hole is the answer here.

It is a good idea to have your Dart given a check-up at 5,000 miles if the car receives the all-too-common hard service around town. This should be in addition to the first check-up at 1,000 miles and the oil and oil filter element change which should be done every 2,000 miles after the first 1,000 mile change. Dodge certificated car-care lubrication is also recommended every 2,000 miles; tire rotation at 3,000 miles and every 6,000 miles thereafter. But many service men believe that the 5,000-mile check-up for a hard-working modern car should include a lot of things that are normally covered only every 10,000 miles where the going is more favorable. These include a check on brake lining, headlight aiming and front-end alignment. It is also a good time to check the distributor for a cracked cap which can cause misfiring that may lead to a needless check of the spark plugs. In setting the ignition timing on these engines be sure to note that the six is timed at 2.5 BTDC (before top dead center), while the V8 is timed at 5 BTDC (10 BTDC for cars with automatic transmission and for the optional engines except the D-500 which should be timed at 7.5 BTDC.)

Both the Dodge Music Master and the Astrophonic radios are transistorized to reduce radio hum, and have pushbutton tuning. Setting the buttons is not difficult. First have the antenna extended

and the set not only turned on but well warmed up. Pull the button half way out and then tune in the desired station by means of the right-hand knob. Finally push the button all the way in. Repeat this with the other buttons.

Two other points are important. If you are driving out of town and do not want to take time to re-set the push buttons, you merely tune manually by using the right-hand knob. Where the car is equipped with a rear seat speaker under the package shelf the ring around the tuning knob provides for mixing of sound between front and rear speakers. The other point concerns mounting of the antenna. One mounted on the rear cannot be used with the standard radio successfully. The right front fender is the spot for the Dart antenna.

It should be adjusted to the radio by first extending it and then adjusting its compensator (trimmer) for maximum volume with the radio tuned to a weak station around 1,000 kc and with the volume control set for maximum output.

A power seat control is optional for the 1961 Dart but be sure to note that in addition to the manual movement the seat can be relocated for height, tilt or front-or-back positioning to meet your special needs. Check with your Dodge dealer on this.

Still on the subject of comfort remember that if the car has an air conditioner and has been standing in the hot sun, the windows should be opened for a few miles of driving before going ahead with the cool-down. Actual operation of the conditioner is a matter of moving the combination temperature control and blower-switch lever to extreme left and then pulling out to HI blower position. Next push in the MAX cool-air button and raise the upper air outlets for best air circulation. There's a special vent at the lower left side of the instrument panel area to give additional cool air for the driver's legs and lap.

To the left of the driver's feet is the pedal-operated parking brake. To set this you simply press on the small pedal. To release it you pull up and push down on the release handle. Dodge's parking brake still [*Continued on page* 160]

SERVICE TIPS

from Detroit

To avoid damage to the vinyl rear window, Chevrolet convertible owners are advised, when putting away the jack, to see that the column is stowed flat and tight against the metal shield covering the hydro-electric pump. Ratchet and lift-hook assembly may be placed at either end of the column. If the column is stowed under the tire sidewall, the wheel, being tilted, is liable to press against the window when the top is in its folded position.

* * *

Plymouth and Valiant models having Torque Flite "6" transmission occasionally develop a "no-drive" condition after the first stop when cold. In such cases check transmission oil level as engineers find that when this is low the "no-drive" condition results.

* * *

The AS-2934-SA carburetor for 1959 Lark VI models will continue to be available until further notice but at a revised price. Suggested list price is $27.50—net exchange cost $17.

* * *

One of the main sources of clutch noise in 1960 Fords is squeaking from the clutch pedal linkage. To cure this apply a little oil at the attaching points of the assist spring then coat the areas with Lubriplate. Put a drop of oil on each nylon clutch-pedal pivot-shaft bushing.

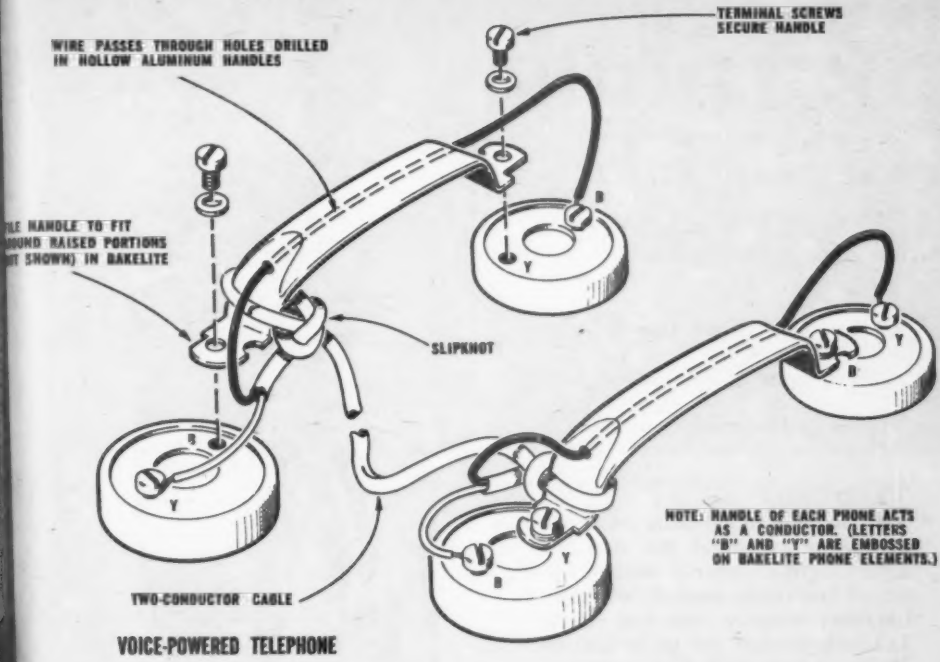
* * *

On Dart 318-cubic-inch engines with two barrel carburetors the air assembly may interfere with the choke lever preventing the choke from closing. This means starting difficulties and is caused by incorrect indexing. To position air cleaner correctly make sure that the looped end of the clamp handle is located on the right side, approximately two inches to the rear of the assembly's center line.

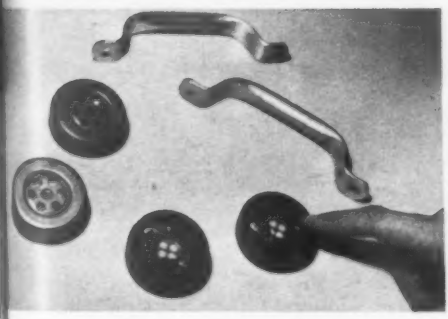
PAIR OF PHONES are an ideal means of communication between workers engaged in installing a television antenna. One man on the roof aims the antenna while his assistant inside the house watches the TV picture and reports by phone as the antenna is "zeroed in" to provide maximum performance.

VOICE-POWERED TELEPHONE

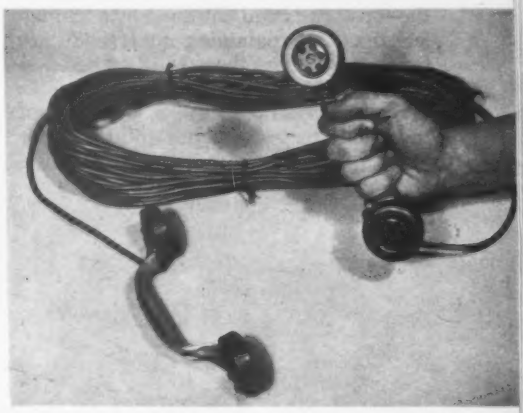
THESE completely portable phones are ideal for communicating between any two distant points—for coordinating sporting events, for example, or for orienting TV antennas. The only difference between these units and comparable commercial models is about $15—the amount you save by making them yourself. Yes, you can assemble this communication system at a cost of $3.70 plus $1.76 for each hundred feet of wire. Parts are easily available and construction is simple—just a matter of mounting the phone elements on the ends of the two metal carrying handles which



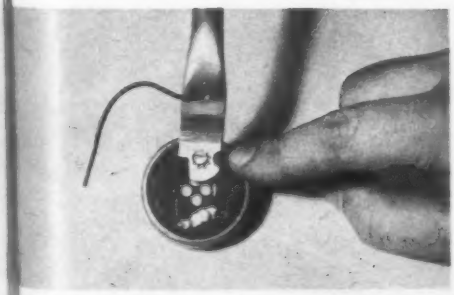
VOICE-POWERED TELEPHONE



PARTS consist of metal handles and phone elements. Finger indicates terminal screw.



PORTABLE voice-powered telephones operate without either batteries or switches.



NOTE how end of handle is filed to fit between raised portions of phone element.

serve as handgrips for the telephones.

Forget about batteries. These telephones work off lung power! Your normal voice is carried over thousands of feet of wire with the aid of strong permanent magnets.

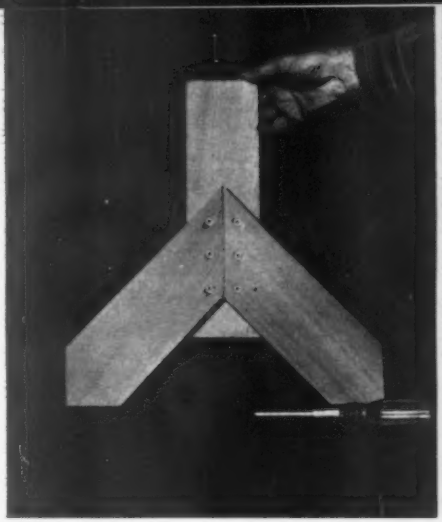
When you speak into the mouthpiece, your voice causes a thin metal disk to vibrate. The [*Continued on page* 161]

OUTDOOR COFFEE TABLE

Let's get out of the house and take a relaxing coffee break in the wide open air!

RED CEDAR was chosen for this all-weather coffee table because of its ability to withstand the elements, its light weight and its natural beauty. The list of materials needed to build it is very brief: seven four-foot lengths of 1x4-inch dressed red cedar and 46 No. 10, 1¼-inch brass flathead screws.

Select the six best pieces of cedar for the top boards and cut them into 33-inch lengths. The remaining short ends are for the legs. Trim these to 12 inches. Rip the seventh piece in half lengthwise to make two four-foot 1x2's. Cut one of these lengths to 20 inches and the other to 28 inches. These will be used for the



TWO LEGS, cut and positioned as shown, are fitted to an upright with six screws.

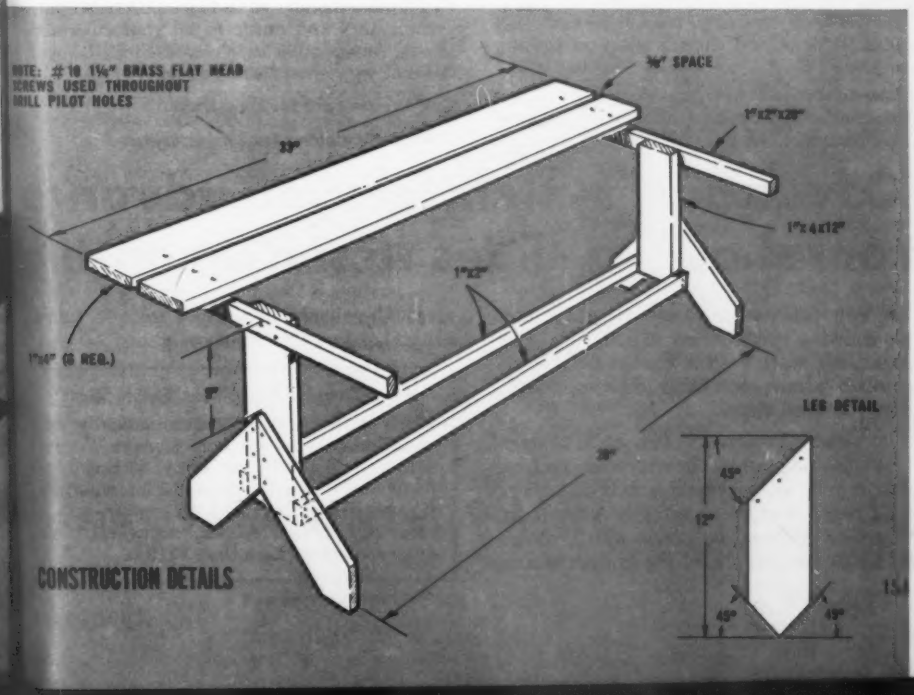
THREE SCREWS secure T-brace to upright. Screw on top boards to complete assembly.

top T-braces. Sand all cut ends using fine sandpaper over a block of wood.

Assembly. Take four of the six 12-inch leg pieces and cut their ends to 45° as shown in the drawing. Fit the legs together and screw each pair to its respective 12-inch upright. The two 20-inch T-braces are now screwed to the uprights as shown. Screw the 28-inch footrest braces to the base of the uprights. Complete the assembly by screwing the top boards to the T-braces leaving a ⅜-inch space between each board.

Finish the table with three coats of clear marine varnish to bring out the full texture of the wood.

Now all that remains is to lean over the back fence and call, "Hey, neighbor! C'mon over—coffee's served!" •



CONSTRUCTION DETAILS

New Ideas in Photography

1. Kodak Cavalcade Projector, Model 510. With 5-inch *f*/2.8 lens, less than $140. Model 520, with 5-inch *f*/3.5 lens, less than $110.

2. Two types of trays hold all 2 x 2 mounts.

3. Five lenses let you fit picture on big and small screens, at long and short projection throws. Sizes are 3", 4", 5", 7" and zoom (3¾" to 6¼").

4. Two condensers: universal, for all 2 x 2 slide sizes; hi-efficiency condenser for extra brilliance with 35mm and No. 828 slides.

5. Remote control cord, 12 feet long.

6. Extension for remote control cord adds 25 feet. Use any number.

7. Programmer lets you add synchronized voice commentary and music to all your color-slide shows. Any popular tape recorder may be used. Makes every show "come alive."

8. Carrying case for slide trays.

9. Protective cover for projector case.

"Cavalcade" system lets you advance from showing slides to *showmanship*

Now you can custom-build an automatic slide-showing system that exactly fits *your* needs. Just start with a Kodak Cavalcade Projector (*shown above*) and add components when you need them.

Cavalcade Projectors not only change slides automatically—they also let you reverse, repeat, skip, or hold a slide on screen. Don't need constant focusing because slides are pre-conditioned by warm air. You can edit slides instantly. And the system of aids gives Cavalcade Projectors unique versatility. Let your dealer show you.

New Camera Simplifies Flash Shots

Flash exposures are set automatically by new Kodak Motormatic 35 Camera. When subject is 5 to 25 feet away, setting the focus also sets lens opening. Film-winding is automatic, too. A tiny motor automatically advances film, cocks shutter, after each shot. Less than $110.

from Kodak

New wonder metal brings rich sound to your 8mm movies

Precision engineering and a new "wonder metal" have now brought top-quality do-it-yourself sound to 8mm home movies.

New Kodak equipment lets you convert your 8mm films to sound movies—with wide-range music and your family's true-to-life voices. All it takes is a magnetic stripe on the film and a Kodak Sound 8 Projector in your living room.

You need precision magnetic striping, such as Kodak Sonotrack Coating, and a precision projector—because the magnetic stripe on 8mm film is only 3/1000 inch wide!

The sound-pickup head is so small that ordinary magnetic materials wear out quickly. Kodak engineers achieved an almost wear-proof head by choosing Alfenol—a new, incredibly hard magnetic alloy. It gives hundreds of hours of use!

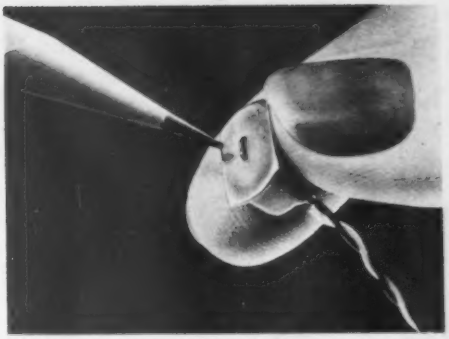
And the engineers found a way to keep the 2/1000-inch-wide head dead-centered on the 3/1000-inch track. There's no "edge tracking" to distort sound.

How the system works. Ask your dealer to have Kodak Sonotrack Coating put on your 8mm films. Then project the film with a Kodak Sound 8 Projector. Talk through the mike. Add music, sound effects, by connecting your record player or tape recorder to the projector.

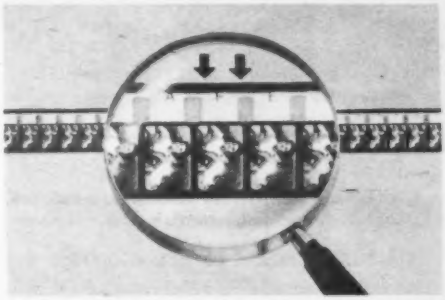
After recording, play your new sound movie back instantly. If you want to make changes, just erase and re-record! You play back through the projector's own high-quality balanced amplifier system. Or you may hook in your home hi-fi system.

Movies are brilliant and sharp, up to five feet wide. Choice of two forward speeds (16 and 24 fps), still and reverse.

Kodak Sound 8 Projector, with mike and phono connector cord, is less than $350. See your dealer for exact retail prices.



INCREDIBLY HARD magnetic head made of Alfenol will record for countless hours without any loss in the sound quality.



TO ADD SOUND to your 8mm films, take processed film to dealer and have Kodak Sonotrack Coating applied to edge. Costs but a few cents a foot.

VOICES, MUSIC, SOUND EFFECTS add realism, professional touch. Children's voices, recorded at different ages, dramatize growth shown in movies.

Prices are subject to change without notice.

Many dealers offer terms as low as 10% down.

Kodak
TRADEMARK

EASTMAN KODAK COMPANY, Rochester 4, N.Y.

See Kodak's "The Ed Sullivan Show" and "The Adventures of Ozzie and Harriet"

TABLE-TOP AQUARIUM

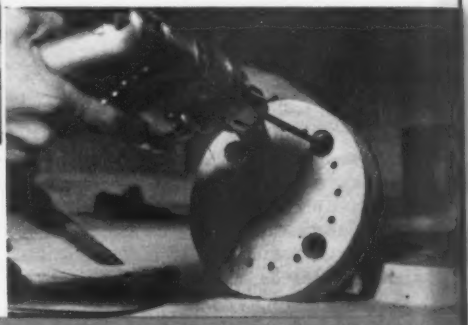
Makes a lovely night light for your child's room, too.

HERE'S a conversation piece that will intrigue your guests and delight the small fry. Made of scrap materials, it can be shaped and assembled in an hour or two at a cost of pennies.

You'll [*Continued on page* 162]

ORIGINAL DESIGN is a real eye-catcher. Decorate aquarium to match decor of room.

AIR HOLES should be drilled through the lid before the aluminum side is attached.



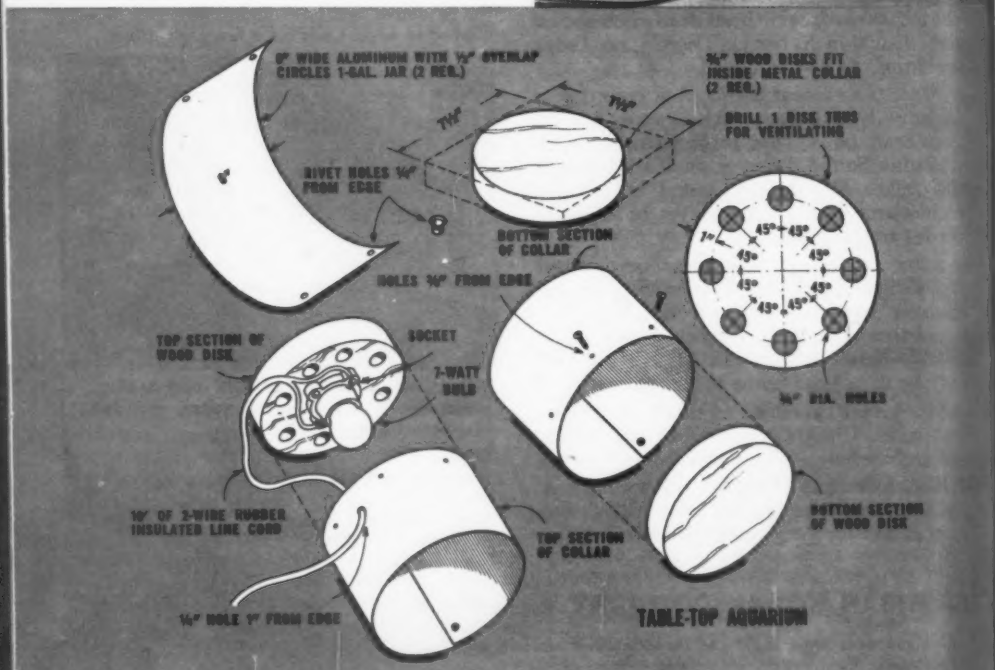
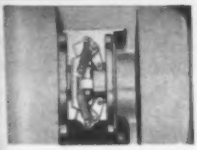
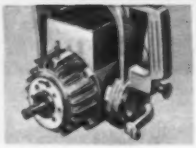


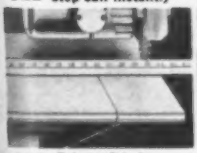
TABLE-TOP AQUARIUM



SEE Built-in motor brake stop saw instantly



SEE Totally-enclosed 2 H.P. motor



SEE Extra safety in drop-leaf table

SEE Cut-off scale speed repeat cuts

SEE Use of low-cost right hand tools

SEE Roller bearings ride quietly, smoothly

Go now to your nearest DeWalt dealer and ask for a free demonstration of this great new model 925-H. It's loaded with exclusive VALUE features you've been waiting for. See it...test it yourself...and you'll surely want to own it!

DEWALT, Inc., Dept. MI-461
A *Black & Decker* SUBSIDIARY
Lancaster, Pa.

☐ Please send me free 20-page CATALOG.
☐ Please send me name of nearest dealer.

Name_____

Address_____

City_____ State_____

Slamming over a log at full throttle is a brutal test of outboard stamina. Time after time, standard 45 hp Mercurys and other outboards were subjected to this "destruction test". Most competitive engines failed early — but Mercury outboards were going strong after dozens of jolts!

Mercury doesn't recommend this kind of outboarding, but every outboarder should be happy to know that Mercury motors thrive under treatment far rougher than they meet in normal boating use. The margin of durability built into Mercs demonstrates the advanced engineering and construction that put Mercury years ahead!

Only Mercury offers patented Glide-Angle Design twins — plus three *4-cylinder* engines in 40 to 50 hp classes — *plus* 6-cylinder family outboards! See your Mercury dealer . . . check his liberal trades, easy terms!

Tommy Bartlett says: *"In my Tommy Bartlett Water Ski Shows, our famous jumping boats with 22 hp Merc 200's have thrilled audiences around the world with over 30,000 jumps in the past two years — with never a motor failure! That's real dependability!"*

WORLD'S NO. 1 OUTBOARD . . . 11 GREAT MODELS FOR '61 . . . 6 TO 80 HP!

photographed at Florida's Silver Springs

50 hp Merc 500
most powerful four
in Mercury history

Reasons why Mercury gives you the best run for your money!

DYNA-SHOCK ABSORBERS minimize impact shocks and rebound force when motor strikes a submerged object. Simultaneously, Safety-Tilt Switch automatically cuts ignition until propeller returns to water.

FORGED ALUMINUM CLAMP BRACKETS, heat treated to the strength of steel, are practically unbreakable. Fine-thread clamping screws give Mercurys super transom grip.

UNI-CAST LOWER UNIT has one-piece housing that maintains precise alignment of gears, bearings and shafts; more leak proof; eliminates bolts, gaskets and screws on highly stressed members.

STREAMLINED DESIGN of lower unit is hydrodynamically correct for maximum efficiency. No protruding nose to hook weeds and underwater objects.

©1961
Kiekhaefer Corp.
Fond du Lac, Wis.

WHERE OTHER OUTBOARDS LEAVE OFF . . . MERCURY TAKES OVER!

Golden Hammer Awards

[*Continued from page* 129]

Each craftsman whose project is shown receives a 24-karat gold-plated Hammer and a Workbench Award Certificate. Runners-up will be sent a beautiful gold-plated Golden Hammer Tie Bar or MI's Certificate of Merit. So send us some *black-and-white photos, with negatives*, and a full description of your latest project. Photos of your workshop are also eligible. Send all entries, with return postage, to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th St., New York 36, N. Y. Entrants are advised that MECHANIX ILLUSTRATED cannot accept responsibility for customs charges, duties, taxes, etc., levied against Golden Hammer and Golden Hammer Tie Bar winners outside the United States.

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The following craftsmen have been awarded CERTIFICATES OF MERIT for their projects:

Gordon K. Holz, Milwaukee, Wis. . . Anthony Maranto, Harbert, Mich. . . Frank M. York, Lawrence, Kan. . . George E. Norris, San Diego, Calif. . . Bertrand Girard, Woonsocket, R. I. . . William E. Hagaman, New Market, N. J. . . Charles Mallett, Reading, Mass. . . David R. Graves, El Paso, Tex. . . E. Alpert, Johannesburg, S. A. . . E. J. Wiktor, North Olmsted, Ohio. . . A. E. Hedahl, Libby, Mont. . . Herbert H. Eller, Bel Air, Md. . . Kelly Carmacle, Phoenix, Ariz. . . Jim and John Sterner, Morton Grove, Ill. . . Louis M. Marey, Babylon, L. I., N. Y. . . Tony Schmidt, Spokane, Wash. . . Oscar Loken, Lakota, N. D. . . H. W. Johnston, Houston, Tex. . . George L. Lampl, Kouts, Ind. . . John Soto, Bronx, N. Y. . . . Stanley Kopydlowski, Wis. . . Frank Wright, North Babylon, N. Y. . . Bob Percival, Redlands, Calif.

Look for the names of more winners next month.

Your New Dodge Dart

[*Continued from page* 149]

operates on the transmission shaft. Be careful to release it fully before moving the car. If you prefer a quicker return action of the service brake pedal a return spring and retainer can be installed. You can obtain these MoPar parts from any Dodge dealer. To install first disconnect the push-rod at the brake pedal. Then install the spring on the push-rod of the master cylinder, insert the retainer into the push-rod's sealing-boot groove and reassemble the rod to the pedal.

Dodge engineers advise draining, adjusting, cleaning and refilling the automatic transmission every 11,000 miles (or more often in dusty country). Darts can be push-started even with the automatic transmission. Switch ignition on, push in L button, and give the engine a little gas. At 25 mph the engine should turn over.

Meeting your new Dart half way is a sure cut to starting what Dodge describes as a wonderful friendship. •

Glass—Handle With Care

[*Continued from page* 136]

should be checked and, if necessary, straightened with a pair of needle-nose pliers.

Some octals and miniatures intended for high-voltage circuit positions have an additional connector cap attached to the top of their metal or glass shells. Avoid handling these tubes by this cap because the cement joint here is not too strong.

Are you apprehensive about the idea of wrestling with the tubes of an ailing set because your knowledge of electronics is scanty? Don't be. There is a better than 90 per cent chance that replacing one dead or dying tube will cure the trouble.

How to find the culprit? First, pull 'em all out. Then have them tested by your local radio-TV dealer. By the way, repairmen generally offer this service free as a means of attracting customers. Of course, if you're a bit of a "bug" on electronics you may have a tube tester with which you can check your own "dead soldiers." •

Voice-Powered Phones

[*Continued from page* 151]

vibration of this disk creates a tiny electric current (this is so because the metal disk is cutting across the magnetic field of the permanent magnets previously mentioned). The tiny current thus generated passes along the cable and is turned into sound waves at the other end.

The accompanying pictures show how the ends of the handles are filed and fitted into the area around each phone's terminal screw. These screws turn down on lock washers and hold the handles firmly.

Operating the phones is simply a matter of speaking and listening. There's no on-off switch—no need for one. The model shown here was tested with both 100 and 1000 feet of No. 22 wire with no audible difference in volume.—*Len Buckwalter*

PARTS LIST

4 magnetic phone units (available from Burstein-Applebee Co., 1012-14 McGee St., Kansas City 6, Mo. Cat. No. 18A515).
2 aluminum carrying handles* (Bud No. UH-7A).
Length of two-conductor wire* (Belden No. 8740).
* Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

STEREO HEADPHONES

PERSONALIZED high fidelity stereo listening is possible with this headset. Each earphone is a miniature speaker for each channel. It is available from Allied Radio Corp., 100 N. Western Ave., Chicago 80.

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FOLEY FILED SAWS BRING NEW CUSTOMERS

Here is a steady repeat CASH business that pays from $3 to $6 an hour, and you can start in your own basement or garage in your spare time. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings more customers. J. C. Deibert wrote us: "Since I got my Foley Filer five years ago, I have averaged 4¼ saws each day over all this time." Howard Kuhns says: "We operate 2 Foley Filers, and our business averages about 500 saws per month. The count last year was 5,798 saws."

The new model 200 Foley Saw Filer (shown above) is the **first** and **only** machine that automatically sharpens combination (rip and crosscut) circular saws—also all hand saws, band saws and crosscut circular saws. The adjustments are simple—there is no eyestrain—and you can start right away to turn out perfect cutting saws. Exclusive jointing action evens up irregular teeth—old saws cut like new!

"MONEY MAKING FACTS" explains how you can get business from hardware stores, home owners, farmers, carpenters, schools, mills, factories, etc. Just think, with a modest investment, no overhead, no stock of goods to carry, you can start right in on a cash business that will help pay the rent, buy groceries, or a new car. Time Payments available; send coupon today for this practical money making plan. No salesman will call.

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Table-top Aquarium

[*Continued from page* 156]

WITH JAR in its base, try on the lid for size; design to suit, and the project's done.

need two pieces of aluminum six inches wide and long enough to circle a one-gallon pickle jar (the aquarium). Make sure the ends of each piece overlap by at least half an inch.

You'll also need two pieces of ¾-inch scrap wood, some lamp cord and a plug, a seven-watt bulb, a socket and a few quarter-inch rivets and wood screws.

Cut the aluminum pieces to fit like collars around the top and bottom of the jar. Fix the diameter of these by driving a couple of rivets through the overlap of each. Round off the two wood blocks until they fit snugly inside and flush with a rim of each collar and secure them there with wood screws. Now drill a series of air holes through the top block as shown in the drawing. Don't drill through the center part because that's where the light socket will be mounted. (By the way, once the aquarium is in use, always keep the water level at least three inches below the bulb to be certain no contact is made.)

Decorate the cylinders by painting them or covering them with contact paper. Put some sand or gravel in the jar, add an aquatic plant or two and then—with the jar three-quarters full of water—drop in your goldfish. Set the top over the jar and plug in the light. Suddenly you're admiring an aquarium, an attractive piece of "living" furniture and an artistic night light. •

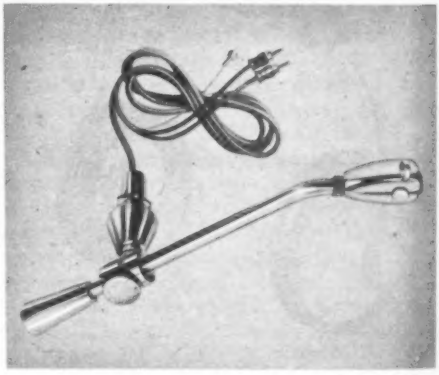
Electrified Lawn Mower

[*Continued from page* 111]

gear which carried the drive from the wheels to the blades when the mower was hand operated, and to replace it with a washer or spacer of the same thickness. The driving wheel was then removed from the blade shaft and the larger pulley (3½ inches) pushed in place and made fast by means of its setscrew. The 2½-inch pulley was then tightened to the motor driveshaft and connected to the other pulley through the V-belt. Finally a switch box was attached to the mower's handle by a metal strap. A three prong grounding-type twist plug was used to connect the motor's power cord to the main power line as this type is less easily pulled out accidentally. No. 16 gauge wire (with ground lead) was used to avoid voltage drop; 100 feet of cord was found to be more than adequate.

A mower electrified in this way still needs to be moved around the lawn manually, as the power drives the blades *not* the wheels. The fact that the mower is not self-propelled is in many ways an advantage. Less walking is needed, as cutting goes on whether you are pushing or pulling. •

NEW STEREOTONE ARM



TONE ARM, designed for stereo or mono records, features a permanently attached cable, leads, shield and a ground wire. Micropoise arm is made in 12 and 16-inch models by Rek-O-Kut Co., Corona, N. Y.

McCahill Tests Scout

[*Continued from page* 79]

mph. Then I hit a soft spot. Before you could flick a fly off the end of your nose, the Scout had sunk in.

I quickly tried to reverse to harder ground. No go. I was locked in, axle-deep front and rear, the "four-wheel drive" now became two-wheel, and that was it! The Rover was still on harder sand so we rigged up a chain to try and yank the Scout out backwards. The instant we applied pulling power on the Rover, it too broke through the crust and was up to its axles. We were both stuck, but good. Jim McMichael went on a long hike up the beach and finally reached a telephone, calling a wrecker for help. It was becoming pretty critical, as the tide was moving in and unless we got out within half an hour both cars would have been under a few feet of water. The tow truck almost got stuck trying to reach our vicinity. But with his long wire cable and hook, from a spot a good 200 feet inland, the driver snatched out the Scout first and then the Rover. Fifteen minutes later there was two feet of water over the place where both cars had been.

At this near-sinking, Brewster Shaw, many times Speed Trial Champ on the beach, was with us. When he and Jim and I got back home and began discussing the situation, the first thing we decided was that if the Scout had had 7.50 tires it probably could have kept going without getting into trouble.

For the next day's test we decided to match this new cross-country kid against my Willys Jeep which is now seven years old but as perfect as the day it left the factory. We crashed the Jeep and the Scout over and up dunes. These revealed some pretty interesting findings. Again, the Jeep had better size rubber, 7.00x15. It could out-climb the Scout but not by too much. Actually, though the Scout engine is slightly larger and has much more horsepower (86.9 @ 4400 rpm versus 70 @ 4000

[*Continued on next page*]

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President
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rpm) and a higher torque rating (135 ft. lbs. @ 2400 rpm versus 112 ft. lbs. @ 2000), the Jeep had more torque for real tough climbing. This could be due to transmission gearing but I got the impression that the Jeep engine had a little more whop when under full power and extreme loads. Next we took the Jeep and the Scout close to the water's edge (on Daytona Beach this time, where the sand was as hard as a mother-in-law's stare). We put a chain between the two, back to back, and started a tug-of-war. The result was a dead heat —neither vehicle could pull the other an inch backwards. They just stood there and dug themselves toward China, each time through the hardest sand this side of concrete.

Later, we took both the Scouts to the Daytona International Speedway for some performance runs. I found that the full cab body on the 4x2 could very well do with a mattress-full of sound-deadening material in the roof. The drumming is fairly severe—in fact, much too severe for any real comfort on a long trip. The steering wheels of both cars come out too far on the post and would be much more comfortable to drive if they were recessed toward the instrument panel by two or three inches. The two-wheel drive job is quite agile, batting out 0-60 in 15.6 seconds and 0-30 mph in 5.2. The 4x4 does the 0-60 mph route in 22 seconds and takes seven seconds flat to reach 30 mph. On my high-speed runs made at the Speedway, the top speed of the 4x2 was 80 mph, right on the nose, and I cranked 71 mph out of the 4x4.

I was much more interested in the four-wheel-drive babe. Like the two-wheel drive Scout (which has an identical five-foot-long pickup body) and unlike the Jeep, it has real cargo-carrying capacity. If the steering wheel were better positioned with a shorter post, the 4x4 Scout would be a fairly comfortable car. The ride was good, considering the vehicle, and the fittings and appointments pleasant if not posh. At the comparatively low price this car is selling for I think it's a helluva buy for anyone who does much hunting, farming or just plain woods-whacking. The rear of the standard cab is quite large and should hold at least a half dozen embalmed Chinamen, two kegs of beer and a ukelele.

Both these vehicles are offspring of International Harvester, which means top quality by a major, highly-respected outfit. It wouldn't surprise me to see new versions of the Scout within a year featuring soft, rag or canvas tops that can be quickly lowered, making the car a real popular favorite with sportsmen everywhere. As it is, with the top removed the Scout can be used as a great shooting and safari car although heavier bumper provisions will have to be made to hold a stump-catcher when driving in quail country. I use a piece of quarter-inch armor plate as a stump-catcher on my Jeep; without it, the tie rods would be ripped out several times a day when hunting in Florida. Tree stumps down there have been cut by pixies to grass height (which is tie-rod height) and they can't be seen until you smash into them.

In summing up, I think the Scout is a real fine contribution to our portfolio of American vehicles. The seats are far more comfortable than you get in a Jeep and with slightly larger tires it will go anywhere a Jeep can go. If you're in the market for such a car, don't buy until you've checked over the Scout. •

McCahill Tests Buick

[*Continued from page* 82]

with dynamite in both fists. I'd driven it around for nearly a week before I had an occasion to really push it. When that time came I was on my way to a quail shoot. I had a long line of cars to pass and gave it the "go" jab. After I'd passed the long line without any trouble I still wasn't sure whether this car had any real moxie or not. It seemed to go like a muscle-sore bat out of a liniment factory but it didn't give out with any of the accompanying noises one usually associates with a car that's unwinding. There was no deep-throated roar, no fussing or messing around in the engine room and no transmission whine. In fact, this job is so silent it's a complete fooler. Several times on that trip I belted it and looked at the speedometer. I found it harder to judge the speed of this chariot than any car I've ever driven. It was like traveling 600 mph in a jet while you casually nibble a sandwich.

With this in mind, I took the Invicta to

the Daytona International Speedway the very next morning and made some speedometer tests. I found the speedometer reading 60 mph at an actual 58.06—not bad by today's standards. After checking out the speedometer and some other points, I started making some two-way acceleration runs. On the first one, to a corrected 60 mph, I tried to guess my time—at which I'm usually fairly close. But my two watches told me I was way off on this babe. I had figured about 10 seconds flat but the actual time on the first attempt was 8.3 on one watch and 8.2 seconds on the other! That silence was the fooler. The same is true of all my other runs; the car was doing a great deal better than the sound would indicate.

Zero-60 mph came off best when starting in the Low range where the best times made were 8.1 and 8 seconds flat. In Drive range all the way it averaged 8.9 seconds. Forty-60 mph averaged 4.6 seconds, which

[*Continued on next page*]

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is real fast. Again, there were none of the usual telltale indications. With just the most modest of tune-ups this job will reach 120 mph. Even at extreme speeds the noise level is amazingly low and the car tracks like a race car.

When my acceleration and speed trials were over, I took the Invicta over to the sports-car course and gave it a wring-out there. The car tracks extremely well for a four-door hardtop but there is some deep body roll when you square the corners really hard. After several hours on the Speedway, I made a trip to Daytona's famous beach for trying out spins and slide control. While this isn't any real out-and-out competition car in the stiffness department, its control was fairly top-grade. Even in complete 360-degree spins it was simple to get back on a straight course with just the minimum of corrective steering.

The big deal with Buick for several years has been its brakes and in this department no car made in America can top it and very few can match it. The AirFlow aluminum front brake drums really do a job. The one fault these brakes may have, if you drive several cars in the course of your daily rounds, is that they are *so* great you might toss Grandpa, goatee and all, right through the windshield and out onto the hood. As this is being written, I have several test cars at my place in Florida and all are driven every day. By now, no matter who takes the Buick, he remembers to give the brakes just a bit of thought before applying because these babies really do *stop* you. I recall making a series of brake tests with a Buick when they first started using these finned drums some time ago, and several panic stops from more than 100 mph failed to induce any dangerous fade.

Two minor complaints (easily changed by spending more money) are nonpower

[*Continued on page* 175]

Buy And Fly Own Plane

[*Continued from page* 61]

everything in this world can be financed and airplanes are no exception. Whether you buy a new or used airplane, there are numerous finance plans available which are geared to fit into your budget. The ease

of financing and the varied payment plans available are sales points pushed strongly by aircraft manufacturers and distributors.

The popular movement toward homebuilt aircraft should be mentioned here. Interest in homebuilts has become very strong since 1955. The major exponent of this build-it-at-home concept is the Experimental Aircraft Association which now has more than 40 local chapters. The primary advantage of the homebuilt aircraft is that you can build precisely what you want with tailor-made design and performance characteristics. There is a plane-plan for almost any type of craft you'd like to build. Prices for the plane-plans range from $4.75 up. (*For further information and a complete list of available homebuilt plane-plans, write to the Information Department, Mechanix Illustrated, 67 West 44th St., New York 36, N. Y., and enclose a self-addressed, stamped envelope.*)

Maintenance costs for the average $3,000 lightplane will run about $300 a year. This includes mechanical work, inspections and small repairs which may have to be made during the year. Aircraft engines are not as prone to troubles as auto engines, so most maintenance expense is due to preventive inspections, rather than to repair and replacement. Overhaul work on an aircraft engine usually isn't necessary until about 800 hours are on the engine. When you realize that the average Private Pilot will fly about 150 hours a year, you can see that overhaul periods are few and far between under normal operating conditions.

Hangar rental for the light airplane will average $25 a month at the smaller airports and up to $50 a month at the larger airports. As an alternative to hangaring an aircraft, the owner can tie it down on the airport grounds for about half the cost of hangar rent. It is preferable to use a hangar for the same reason you'd use a garage for your car—to keep it out of the weather.

Of the 3,000 commercial airports in the country, only about 400 have control towers requiring radio contact between pilot and airport. The vast majority of airports are of the sod-strip variety and can be found near most medium-sized towns.

[*Continued on page* 170]

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Wet-Fly Fishing

[*Continued from page* 88]

wet flies, it is a good idea to start fishing with a few simple casts and techniques that have proved successful over the years. The most productive of these is the three-fly drift cast. It seems ideal for beginners in all parts of the country.

There are several sound reasons for this. First of all, by using a large, light, easily-seen fly for the dropper fly (the one nearest the tip of the rod), the beginner can keep close track of his flies while under water. I suggest a No. 10 Royal Coachman wet fly which has a lot of white in it. It's a funny thing about this dropper: many times it will take trout, skipping along or dappling the surface, as the other flies down near the bottom carry it with the current. Yet, if you fished the same fly by itself, you might not take a fish all day.

Another time, the tail fly (the one furthest from the rod tip) will take all or most of the fish. For this fly, I like a dark pattern, either brown, black or blue, depending on what I see in the stream before I start fishing.

Still another time, it might be the middle fly that takes the trout. For this fly I like to start with a Light Cahill in Eastern waters and a Ginger Quill in Western streams.

The color, shape and size of a fly play their part, but it is mainly the action that determines which fly on a string of three the trout take on a certain day. The flies are tied on nine-foot tapered leaders two feet apart on six-inch tippets. Each has a distinct action much of the time, an action given it by the other flies traveling through the water. So in fishing such a string the beginner has a triple advantage. He can see the dropper fly, fish three likely patterns and have three different underwater fly actions.

It's a good idea for beginners to break into wet-fly fishing in a well-stocked stream, preferably during mid-week when the crowds are back at work. Step into the stream where a long, shallow riffle runs over rocks into a deep pool. Start at the top of the riffle and work downstream. Make your first cast a short one and straight across the current towards the op-

posite shore. Let the flies drift downstream with the current while you keep a tight line. Never take your eyes off the dropper fly or your line. If this fly hesitates in its downstream float or stops even for an instant, strike to set your hook. Many times you'll find that your flies have snagged on a stone or other obstruction, but once in a while you'll hook a fish and be very pleasantly surprised. This stopping of the dropper fly or floating line is the only signal you have most of the time that a trout has taken your fly. So keep alert for the slightest sign and strike instantly. It only takes a trout a second to take a fly, detect the fraud and eject it.

Let your flies drift till they begin to swing in an arc toward a point directly downstream from you. A trout may strike at any time, but there are four especially hot spots: 1. soon after your flies enter the water; 2. after they have traveled about ten feet; 3. when they begin to make the arc; and 4. when they have reached the point downstream from you. Why is this true? No one has ever come up with a satisfactory answer. My theory is that at these points the flies take on the most alluring action, so the fish grab them.

If no strike materializes by the time the fly is directly downstream from you, retrieve it in little jerks made by raising your rod tip and retrieving line rapidly, raising the flies close to the surface. Then lower your rod tip and let the flies sink. Now raise it again, and so on. Repeat till the flies are almost at your feet. This often produces some nice fish. If no fish has taken your flies by the time they are about ten feet from you, lift them gently from the water and cast once more. This time lengthen your cast by two feet, then fish exactly as before. Each cast, lengthen your reach till you've come to limit of your ability, before moving to another spot.

Try casts of different lengths and different speeds of retrieve and fish all the way down the riffle and through the pool. If, after an hour of fishing, you've caught no trout, begin to change your fly patterns. By fishing intelligently in this manner, sooner or later you'll catch a trout. Continue fishing that day in exactly the same manner that induced the first trout to bite. manner that induced the first trout to bite and you should have a good catch. •

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Buy And Fly Own Plane

[*Continued from page* 167]

Aside from exercising caution and following a simple approach pattern, the pilot is free of control and complicated procedures. There are standard in-flight controls for all aircraft but they are easily mastered and are made familiar to the student pilot during his first few weeks of training.

Flying under instrument conditions, however, is another matter. It requires highly precise control and most Private Pilots don't get into this area. A Private Pilot can, of course, take an instrument course and get his Instrument Rating, and he will be qualified to fly in poor weather. Other steps which the Private Pilot can take if he wishes to advance himself are to take instruction for Multi-Engine Ratings and Seaplane Ratings, and he can train for a Commercial or Flight Instructor Certificate which will enable him to carry passengers for hire.

Aside from fundamental information about flight training and costs, there are other facts which prospective pilots should know.

Fear of height does not normally apply to a person in an airplane. Fear of height is caused by sighting down a line that connects you with the ground, such as a ladder or the side of a building. In a plane, you have no such line and rarely have that frightening sensation of height.

Parachutes are not normally used in private flying. Structural failure in modern lightplanes or a mid-air fire is so rare as to be almost nonexistent.

Aerobatics, which requires parachutes, is a highly advanced phase of flying, requiring special training and equipment. It is not part of normal private flying.

Landing fees are not charged by most airports. The few airports which do charge are usually in or near big cities. There is very little red tape in private flying.

For those of you who have doubts about the safety of private flying, here are a few

figures for you to consider: The latest tabulations show that there are 108,485 registered civil aircraft in the United States. Of these, 104,227 or 96.1 per cent are operated by non-airline aviation.

Of the more than 380,000 pilots in the country (currently active), a whopping 64.2 per cent hold Student or Private Certificates. General aviation flies more than three times as many flying hours as the airlines, and airlifts more passengers than all of the airlines put together!

The day you become a Student Pilot, you join a vast family of air-minded Americans who are the nation's most influential aviation group. Welding this group together are many flying organizations, one of which is the Aircraft Owners and Pilots Association. I am a member of this organization, as are nearly 82,000 other pilots and aircraft owners. You qualify for membership the day you become a Student Pilot. The membership of AOPA is current increasing at the rate of 1,000 a month.

So, come join the ranks of America's private pilots. You'll find plenty of good company! •

What's Moon Made Of?

[*Continued from page* 84]

Most rocks contain potassium. "There is no potassium in green cheese," Dr. Hibbs says.

Launched in the nose cone of an Atlas Agena rocket, the Ranger will be about 12 feet long and weigh about 750 pounds. When the rocket has burned out, the spacecraft will separate from it. Its solar panels and antenna will extend and the vehicle will lock on the sun, then roll on its long axis until the antenna points at the earth.

About 66 hours after it leaves the earth, the Ranger will reorient itself so as to back down onto the moon. During the approach it will take a series of television pictures of the moon until it gets to within about 20 miles of the lunar surface. At this point its 300-pound capsule will separate from the doomed craft and by means of a small retro rocket will rough-land on the moon at about 300 mph. Inside this crushable capsule will be a 50-pound crashproof ball containing a seismometer to transmit data on moonquakes or meteoritic impacts. •

To Anyone Who Wants to STOP SMOKING

by Sam Snead

"I am confident that Bantron can help you stop or cut down smoking pleasantly, quickly and easily. You will be amazed at the results you get. I recommend Bantron to my friends who want to stop smoking and I recommend it to you."

Bantron is a safe, new product, developed at a great American university, that has helped thousands stop smoking. In a series of clinical tests, published in a leading Medical Journal*, scientists reported that 4 out 5 men and women who wanted to quit smoking stopped within 5 days when they took Bantron.

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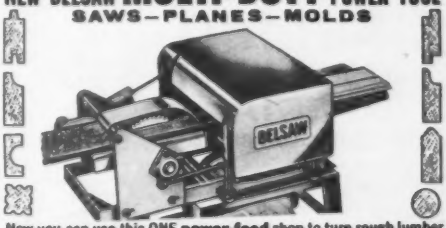

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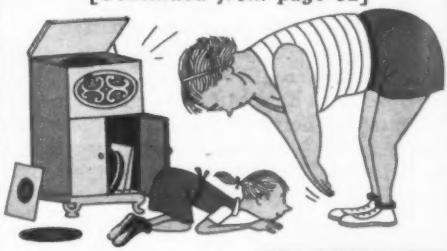
Learn From Records!

[Continued from page 91]



REDUCING is fun using the album How To Reduce In Record Time (Living Method Course): four LP's of muscle-toning advice and slimming exercises at $9.95.

is the Rider Sound-n-Sight series that includes flash cards and instruction booklet. One teenager who had never studied code learned to send and receive 20 wpm in just 20 days by devoting exactly one hour a day to the records. The authors of the Rider course advise the beginner not to push too hard. They suggest an advance of one wpm per day and also caution the student not to move on to the next lesson until an accuracy of 95 per cent on each recorded test run is achieved.

The typing and shorthand courses of the Living Method series make use of the same reinforced learning techniques employed by the Rider code course. The fact is, all three courses were authored by the same two men—Lewis Robins and Reed Harris. They have written and recorded each course expressly for the beginner.

Among the most popular of these listen-learn-participate series are the Music Minus One records. These are recordings of complete orchestrations in which one solo instrument has been left out. *Yours* is the solo instrument. One of the discs is called Fun With Drum Sticks and it comes complete with a pair of life-size drum sticks. And you don't need a drum! You can beat on anything (except your wife) that'll make the sticks bounce.

Perhaps the most ambitious transcribed instructional project of all is the seven-disc Anatomy Of Language, written and narrated for Folkways Records by Morris

Schreiber, a New York City school principal and college teacher. This series is a complete course in the English language and was designed for college entrance preparation. It not only sets out to build vocabulary ("the sanguinary mysogynist was a psychosomatic carnivore") but also delves into reading comprehension and writing techniques. You drill with those tough little tests that give you a sentence with one word missing and five choices with which to fill the blank, all of them seemingly correct. The price of this course is $52.50, not exorbitant considering the excellence of the instruction.

Another turntable tutor has been compiled by ten enterprising airline pilots who got together and produced a series of albums of home-study pilot instruction and issued them under the E.R.G. label. No, you don't have to bring an airplane into the parlor. This 20-lesson education in flying ($22) is presented in simple, easy-to-ken language and covers takeoffs, landings, turns, climbs, controls, emergency procedures and everything else a pilot needs to know if he is to come back in one piece.

We said at the beginning that there is almost no limit to what you can learn from records. Recorded courses are available on the arts of investment, contract bridge and even classical Greek.

So go to it, students—whether flying, skiing, golfing or studying for an ambassadorship to Moscow. The wisdom of the ages is now on wax and at your fingertips—or rather at your stylus tips! •

New Look in Kites

[*Continued from page* 62]

seemed, and so once again the Hutson boys began flying their kites—this time in country around Richmond, Calif.

For a year they tried a number of plastic kites of their own design before they hit on the parachute-type kite that has become their basic product. This seemed to have everything they wanted. All a kid had to do was unpack the kite, attach a tail of plastic streamers and wait for a breeze. Hours of heavy reading in the literature of kite flying revealed no kite design like theirs.

So they hit the market loaded with con-

[*Continued on next page*]

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fidence—only to run head-on into blind resistance to a new idea. "People are used to paper kites," they were told. But after battering at the gates of commerce doggedly for a time they got Woolworth to agree to display a few of their kites. The Hutsons rented a small frame building and began mass-producing kites.

For a year they lost money; then the kites began to move. The sky brightened and the wind freshened for the kitemakers. Their troubles weren't over—they kept finding things wrong with their kites and on occasion they pulled all their kites off the market until improvements had been made. But Hutson kites were being sold across more and more counters—Woolworth, McCrory-McClellan, Kresge, Kress, Neisner, Grant, the big mail order houses, Marshall Field in Chicago, Macy's in New York. And the kites were flying all over the world—Europe, the Orient, the Pacific. A lone order from Pitcairn Island came in. The kites have never been promoted abroad but the orders keep coming. In 1959 the Hutsons made 500,000 kites, grossed better than $135,000.

It's anyone's right to wonder "How did they keep going at first?" The answer: souvenirs for sailors. The Hutsons hired an artist to draw the Navy ships that made San Francisco; the drawings were lithographed and sold to jolly tars on shore leave. The ship pictures still sell to sailors, making a tidy sideline for the high-flying Hutsons. •

PLAY IT SAFE

Be alert to Cancer's Seven Danger Signals. Call your local office of **American Cancer Society** for more information.

McCahill Tests Buick

[*Continued from page* 166]

seats and hand crank windows. In most cars, especially those made by General Motors, a power seat is a rather necessary piece of equipment if the car is to be driven by several different members of a family. The test car, as already stated, had wind-up windows which are usually all right except that in this '61 Invicta it was easy to bark your knuckles against the vent window crank when lowering the driver's window. And, if you have extra-long arms like Jim McMichael, your elbow may do a little bouncing off the door handle when you're rolling up the window. (Okay, wiseguy, I know—"reach across and do it with your right hand." But you must admit this could become a little sporty on a zigzag road).

In summing up, the 1961 Buick Invicta is the best car this famous marque has ever built. Buick has had some good years and some poor years but car-wise this is a real top year for them. More important, Buick doesn't seem to be quite as greedy as some of the other manufacturers; they toss in a lot of little extra goodies such as the trip meter and 15-in. wheels, rugs and arm-rests—just little things, but wasn't it Horatio Fink who said, "Good big things is made up of lotsa good little things?" •

Tracers Map Pear Changes

Using radioactive tracers that map chemical action, Oregon State College researchers are trying to determine how carbon dioxide given off by pears during storage causes the fruit core to turn brown. Radioactive carbon isotopes may be able to trace the carbon dioxide pattern of attack in the fruit. So-called "brown core" in pears has become a problem in recent years with the widespread use of sealed plastic bags for storing pears through the winter.

Tasseling Time Is Watering Time

Farmers who produce top corn yields apply water when the corn begins to tassel, according to Gordon Hoff, an extension agronomist at the New Mexico State University. He said corn enters a particularly critical period when the tassels begin to show, and dry soil at this time may cause the pollen to fall before the silks appear, resulting in barren or partly-filled ears.

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Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning
- ☐ Architecture
- ☐ Arch. Drawing and Designing
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Carpenter Builder
- ☐ Carpentry and Millwork
- ☐ Heating
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Commercial Art
- ☐ Magazine Illus.
- ☐ Sign Painting and Design'g
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Automobile
- ☐ Auto Body Rebuilding and Refinishing
- ☐ Auto Engine Tuneup
- ☐ Auto Electrical Technician
- ☐ Diesel Engines

AVIATION
- ☐ Aero-Engineering Technology
- ☐ Aviation Engine Mech.
- ☐ Reading Aircraft Blueprints

BUSINESS
- ☐ Accounting
- ☐ Advertising
- ☐ Bookkeeping and Cost Accounting
- ☐ Business Administration
- ☐ Business Management
- ☐ Clerk Typist
- ☐ Creative Salesmanship
- ☐ Managing a Small Business
- ☐ Professional Secretary
- ☐ Public Accounting
- ☐ Purchasing Agent
- ☐ Real Estate Salesmanship
- ☐ Salesmanship
- ☐ Salesmanship and Management
- ☐ Traffic Management

CHEMICAL
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ General Chemistry
- ☐ Oil Field Technology
- ☐ Pulp and Paper Making

CIVIL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Professional Engineer (Civil)
- ☐ Reading Struc. Blueprints
- ☐ Sanitary Engineer
- ☐ Sewage Plant Operator
- ☐ Structural Engineering
- ☐ Surveying and Mapping
- ☐ Water Works Operator

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Drafting & Machine Design
- ☐ Electrical Drafting
- ☐ Electrical Engineer Drafting
- ☐ Industrial Piping Drafting
- ☐ Mechanical Drafting
- ☐ Sheet Metal Drafting

ELECTRICAL
- ☐ Electrical Appliance Servicing
- ☐ Electrical Engineering
- ☐ Electric Motor Repairman
- ☐ Elec. Engr. Technician
- ☐ Elec. Light and Power
- ☐ Practical Electrician
- ☐ Practical Lineman
- ☐ Professional Engineer

HIGH SCHOOL
- ☐ Good English
- ☐ High School Diploma
- ☐ High School General
- ☐ H. S. College Prep. (Eng'r'g & Science)
- ☐ High School Math
- ☐ High School Science
- ☐ Short Story Writing

LEADERSHIP
- ☐ Industrial Foremanship
- ☐ Industrial Supervision
- ☐ Personnel-Labor Relations
- ☐ Supervision

MECHANICAL and SHOP
- ☐ Diesel Engines
- ☐ Gas-Elec. Welding
- ☐ Heating and Air Conditioning
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Safety
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Plumbing and Heating
- ☐ Professional Engineer
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration and Air Conditioning
- ☐ Tool Design ☐ Tool Making

RADIO, TELEVISION
- ☐ General Electronics Tech.
- ☐ Industrial Electronics
- ☐ Practical Radio-TV Eng'r'g
- ☐ Radio-TV Servicing
- ☐ TV Technician

RAILROAD
- ☐ General Railroad

STEAM and DIESEL POWER
- ☐ Combustion Engineering
- ☐ Power Plant Engineer
- ☐ Stationary Diesel Engr.
- ☐ Stationary Steam Engines

TEXTILE
- ☐ General

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City _____ Zone _____ State _____ Working Hours _____ A.M. to P.M. _____

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